

# **AUTOMOTIVE INDUSTRIES**

---

Published Semi-Monthly

## **INDEX**

**Volume 142**

**January 1 to June 15**

**1970**

Articles by Subject .....	Page 2
Authors .....	Page 5
Companies .....	Page 6

**CHILTON COMPANY, PHILADELPHIA, PA. 19139**

—A—

**ABSTRACTS**

Axles for highway 4 x 4 tractor (North American Rockwell) (3-1 pg 35)

**AGRICULTURAL EQUIP.**

**GENERAL**

Farm machinery in the 70s (6-15 pg 50)

**DESIGN**

Latest tractors from Allis-Chalmers (6-15 pg 53)

**AIR POLLUTION**

Custer's last stand (Editorial) (2-15 pg 59)

LP gas conversion (5-15 pg 59)

A program with a bite (Editorial) (3-1 pg 33)

Unleaded fuel (Standard Oil) (4-15 pg 83)

Assembly—See Production

**ASSOCIATIONS & ORGANIZATIONS**

See also Government Agencies & Activities & Meetings

Farm machinery in the 70s (FIEI) (6-15 pg 50)

Hydraulics in construction field (CIMA) (6-15 pg 55)

SAE congress preview (1-1 pg 49)

SME conference and show preview (4-1 pg 49)

**AUTOMATION**

Chevy bumper press line (4-1 pg 40)

Coil processing line at Chrysler (4-15 pg 75)

"Cold" testing engines at Olds (5-1 pg 54)

Making Cadillac's new rear axle, Part I (1-1 pg 61)

Making Cadillac's new rear axle, Part II (1-15 pg 47)

Plastic molding at Chevy-Flint (5-15 pg 69)

Producing Ford's 351 CID engine, Part I (1-1 pg 66)

Producing Ford's 351 CID engine, Part II (1-15 pg 52)

Ring-rolling of gear blanks (Brenco) (6-1 pg 33)

—B—

**BEARINGS**

New bearings increase load capacity (Federal-Mogul) (6-1 pg 42)

Boats—See Marine

**BRAKES**

Material . . . the common denominator, Part II (I-H) (5-1 pg 49)

Anti-jackknife braking system (Bendix-Westinghouse) (5-15 pg 74)

**BUSINESS CONDITIONS**

See also Financial News

Machine tool builders' report (2-1 pg 59)

Machine tool builders' report (5-1 pg 57)

—C—

**CASTING & MOLDING**

See also Production

Cordless tire (Firestone Tire & Rubber) (4-15 pg 67)

Die casting Vega's block (Chevrolet) (6-15 pg 40)

Material . . . the common denominator, Part II (I-H) (5-1 pg 49)

Plastic molding at Chevy-Flint (5-15 pg 69)

**CLUTCHES**

See also New Developments

Material . . . the common denominator, Part II (I-H) (5-1 pg 49)

**COMPUTERS**

"Cold" testing engines at Olds (5-1 pg 54)

Management strategy at Chevrolet (2-1 pg 39)

Exhibit—See Shows

**CONSTRUCTION EQUIP.**

**GENERAL**

Global concept at MF Ohio plant (6-15 pg 63)

Hydraulics in construction field (6-15 pg 55)

Material . . . the common denominator, Part I (I-H) (4-15 pg 71)

**DESIGN**

Material . . . the common denominator, Part II (I-H) (5-1 pg 49)

Power trains . . . construction vehicles (Caterpillar Tractor) (6-15 pg 58)

**STATISTICS**

Farm and construction equipment industries (6-15 pg 66)

Conventions—See Meetings

**COST**

Cordless tire (Firestone Tire & Rubber) (4-15 pg 67)

Material . . . the common denominator, Part I (I-H) (4-15 pg 71)

—D—

Design—See Engines, Marine, Passenger Cars, Trucks

Diesel Engines—See Engines

—E—

Earnings—See Financial News

**ELECTRONICS & ELECTRICAL EQUIP.**

See also New Developments

Anti-jackknife braking system (Bendix-Westinghouse) (5-15 pg 74)

Coil processing line at Chrysler (4-15 pg 75)

**EMPLOYMENT**

The engine of inflation (Editorial) (5-15 pg 57)

**ENGINES**

See also Agricultural Equip., Construction Equip., Passenger Cars, and Trucks

**DESIGN**

**Gas Turbine**

Truck turbine drive (Dana) (4-1 pg 35)

**Other**

Wankel-powered Citroen M35 (5-15 pg 72)

**PRODUCTION**

**Reciprocating**

"Cold" testing engines at Olds (5-1 pg 54)

Die casting Vega's block (Chevrolet) (6-15 pg 40)

Producing Ford's 351 CID engine, Part I (1-1 pg 66)

Producing Ford's 351 CID engine, Part II (1-15 pg 52)

Die casting Vega's block (Chevrolet) (6-15 pg 40)

Producing Ford's 351 CID engine, Part I (1-1 pg 66)

Producing Ford's 351 CID engine, Part II (1-15 pg 52)

—F—

**FOREIGN BUSINESS ACTIVITIES**

European Round-up (1-15 pg 35) (3-1 pg 29) (3-15 pg 234) (4-15 pg 41) (5-15 pg 51) (6-15 pg 41)

Japan (Editorial) (6-1 pg 31)

Wankel-powered Citroen M35 (5-15 pg 72)

**FUEL**

LP gas conversion (5-15 pg 59)

Unleaded fuel (Standard Oil) (4-15 pg 83)

**FUEL SYSTEMS & COMPONENTS**

See also New Developments

LP gas conversion (5-15 pg 59)

—G—

**GOVERNMENT AGENCIES & ACTIVITIES**

See also Associations & Organizations

Washington Report (5-1 pg 37) (6-1 pg 27)

—H—

**HEAT TREATING**

See also Metallurgy and Production

Making Cadillac's new rear axle, Part I (1-1 pg 61)

Making Cadillac's new rear axle, Part II (1-15 pg 47)

Ring-rolling of gear blanks (Brenco) (6-1 pg 33)

**HIGHWAYS**

Three-D safety research (Ford) (GM) (3-1 pg 54)

**HYDRAULICS & PNEUMATICS**

Die casting Vega's block (Chevrolet) (6-15 pg 40)

Hydraulics in construction field (6-15 pg 55)

Hydrostatic traction drives (Sperdy Rand) (2-15 pg 61)

—I—

Inspection—See Production

—M—

**MACHINE TOOLS**

See also New Developments and Production

**GENERAL**

Chevy bumper press line (4-1 pg 40)

Coil processing line at Chrysler (4-15 pg 75)

Machine tool builders' report (2-1 pg 59)

Machine tool builders' report (5-1 pg 57)

Making Cadillac's new rear axle, Part I (1-1 pg 61)

Making Cadillac's new rear axle, Part II (1-15 pg 47)

Management strategy at Chevrolet (2-1 pg 39)

News of the Machinery Industries (2-15 pg 85) (3-15 pg 240)

Olds piston pin line (2-15 pg 72)

Plastic molding at Chevy-Flint (5-15 pg 69)

Producing Ford's 351 CID engine, Part I (1-1 pg 66)

Producing Ford's 351 CID engine, Part II (1-15 pg 52)  
 Ring-rolling of gear blanks (Brenco) (6-1 pg 33)  
 SME conference and show preview (4-1 pg 49)  
 Machining—See Production

## MANAGEMENT

See also Associations, Organizations, Government Agencies & Activities  
 The corporate purple (Editorial) (6-15 pg 45)  
 GM's war on noise (3-1 pg 46)  
 Management at AMC (4-1 pg 42)  
 Management strategy at Chevrolet (2-1 pg 39)  
 Material ... the common denominator, Part I (I-H) (4-15 pg 71)

## MARINE

### GENERAL

Recreational boating soars (2-1 pg 46)

### ENGINES

Marine engines for 1970, Part I ... Outboard motors (2-1 pg 49)  
 Marine engines for 1970, Part II ... Outboard motors (2-15 pg 74)  
 Marine engines for 1970, Part III ... Inboard engines (3-1 pg 49)  
 Marine engines for 1970, Part IV ... Inboard engines (4-1 pg 43)  
 Marine engines for 1970, Part V ... Inboard engines (4-15 pg 77)

## MARKETING

Japan (Editorial) (6-1 pg 31)  
 Machine tool builders' report (2-1 pg 59)  
 Machine tool builders' report (5-1 pg 57)  
 Powder metallurgy (6-1 pg 37)  
 Recreational boating soars (2-1 pg 46)  
 Unleaded fuel (Standard Oil) (4-15 pg 83)

## MATERIALS

See also New Developments

### METALLIC

#### Aluminum

Die casting Vega's block (Chevrolet) (6-15 pg 40)

#### Steel

Wire cord belt developments (Firestone Tire & Rubber) (3-1 pg 41)

### NON-METALLIC

#### Plastic

Plastic molding at Chevy-Flint (5-15 pg 69)  
 Reinforced plastics (Molded Fiber Glass Body) (Smith-Inland) (2-15 pg 67)  
 Three-layer plastic molding technique (Krauss-Maffei) (6-1 pg 45)  
 Ultrasonics at Detroit Plastic Products (4-1 pg 59)

## MATERIALS HANDLING

See also New Developments, and Production  
 Chevy bumper press line (4-1 pg 40)  
 "Cold" testing engines at Olds (5-1 pg 54)  
 Die casting Vega's block (Chevrolet) (6-15 pg 40)  
 Making Cadillac's new rear axle, Part I (1-1 pg 61)  
 Making Cadillac's new rear axle, Part II (1-15 pg 47)  
 Plastic molding at Chevy-Flint (5-15 pg 69)  
 Producing Ford's 351 CID engine, Part II (1-15 pg 52)  
 Ring-rolling of gear blanks (Brenco) (6-1 pg 33)  
 Wixom re-visited (Ford) (2-1 pg 54)

## MEETINGS

See also Associations & Organizations and Shows  
 SAE congress preview (1-1 pg 49)  
 SME conference and show preview (4-1 pg 49)

## METALLURGY

See also Materials  
 Powder metallurgy (6-1 pg 37)

## MILITARY EQUIP. & ACTIVITIES

See also Government Agencies & Activities and Production  
 French military vehicles (2-15 pg 78)

—N—

## NEW DEVELOPMENTS

See also Materials

### AUTOMOTIVE MATERIALS ILLUSTRATED

Gages, bearing, alternator, plastic (Bremen Bearing) (1-15 pg 62)  
 Insert, distributor cap, cold head-ed (GM) (1-15 pg 62)  
 Liners, cylinder, adhesive bonded, military (Loctite) (1-15 pg 63)

Net adhesive, upholstery bonding (USM Chemical) (1-15 pg 64)

## AUTOMOTIVE PROCESSES ILLUSTRATED

Autoform, casting, forging (Lebanon Steel Foundry) (4-1 pg 52)  
 Cylinder, test autos (Parker-Hannifin) (4-1 pg 54)  
 Welding, stud, instrument panel supports (TRW) (4-1 pg 52)

## NEW PLANT & PRODUCTION EQUIP.

Analyzer, hydrocarbon (Olson Laboratories) (3-1 pg 58)  
 Analyzer, surface (Gould) (4-15 pg 91)  
 Applicator, adhesive, hot melt (Nordson) (2-15 pg 99)  
 Arbor (Gleason Works) (2-1 pg 71)  
 Assembly machine (AMP) (2-1 pg 71)  
 Assembly machine, wheel backing plate (Newcor) (1-1 pg 98)  
 Bender, tube, hydraulic (Pines Engineering) (6-1 pg 51)  
 Body, 5-way valve (Cerro Copper & Brass) (5-1 pg 67)  
 Boring mill, horizontal (Hunter Douglas Machinery) (4-1 pg 51)  
 Brightener, plating (Udylite) (1-1 pg 98)  
 Casting process, ceramic molds (Avnet) (4-1 pg 50)  
 Chucking center, N/C (Cincinnati Milling Machine) (4-1 pg 50)  
 Control, torque (X-4) (1-15 pg 71)  
 Control system, N/C (Heald Machine) (1-15 pg 69)  
 Control systems, robot (AMF Versatran) (4-1 pg 51)  
 Controller (Allen-Bradley) (1-15 pg 67)  
 Converter, motion (Standard Tool & Mfg.) (5-15 pg 83)  
 Coupling, flexible (Stow Mfg.) (5-1 pg 69)  
 Cutter, milling (Farmington) (6-15 pg 93)  
 Cutters, T-slot (Wheelabrator) (6-15 pg 93)  
 Differential casing holes machines (F. Jos. Lamb) (1-15 pg 69)  
 Drafting system, automated (Bendix Aerospace-Electronics) (4-15 pg 93)  
 Drill, N/C (LeBlond) (6-15 pg 93)  
 Drill head, no repositioning (U.S. Drill Head) (6-15 pg 91)  
 Electrical discharge machine (Lincoln Ind.) (6-1 pg 51)  
 Finisher, steering knuckle part (Buhr Machine Tool) (1-15 pg 71)  
 Gage, connecting, connecting rod (Ex-Cell-O) (4-15 pg 93)  
 Gage, engine timing (Bendix Automotive & Automation) (6-15 pg 93)  
 Gage, steering assemblies (Ex-Cell-O) (6-15 pg 91)  
 Gage, thickness (Branson Instruments) (1-15 pg 69)  
 Gaging, testing system, steering knuckle hardness (RCA Industrial & Automation Systems) (1-15 pg 67)

Grease, metals, heavy industries (Texaco) (2-15 pg 99)  
 Grinder, automotive transmission gears (Bryant Grinder) (4-1 pg 57)  
 Grinder, internal, power steering parts (Bryant Grinder) (3-1 pg 58)  
 Grinders (Dotco) (2-1 pg 71)  
 Gun system, fastener (Eaton Yale & Towne) (2-15 pg 99)  
 Hard-facing process (Borg-Warner) (3-1 pg 58)  
 Holder, end mill (Cleveland Twist Drill) (3-1 pg 57)  
 Honer, engine block bearing bores (Ex-Cell-O) (2-1 pg 70)  
 Honing, diamond (Wickman) (4-1 pg 50)  
 Hose, fittings (Parker Hannifin) (5-1 pg 67)  
 Index machines, rotary, Diesel piston crossheads (Snyder) (5-1 pg 69)  
 Indexing, variable (Cincinnati Milling Machine) (5-15 pg 87)  
 Jigmill, heavy roughing cuts (Devlieg Machine) (6-15 pg 91)  
 Machining center, control system (Cincinnati Milling Machine) (5-1 pg 69)  
 Machining center, N/C (Cleerman Machine tool) (3-15 pg 223)  
 Molding machine, compression (U.S. Industries) (3-1 pg 58)  
 Molding machine, injection (Van Dorn Plastic Machinery) (6-1 pg 51)  
 Molding machine, injection, auto parts (Compo Industries) (3-1 pg 57)  
 Numerical control, program (Westinghouse Electric) (5-15 pg 83)  
 Plating process (Udylite) (1-15 pg 71)  
 Plating system (Allied Research Products) (1-15 pg 67)  
 Polyimides (GE) (4-15 pg 91)  
 Press, encapsulation (Pennwalt) (5-1 pg 67)  
 Press, OBI (Niagara Machine & Tool Works) (3-1 pg 57)  
 Presses (Service Machine) (4-1 pg 50)  
 Presses, hydraulic (Applied Power Industries) (5-15 pg 83)  
 Profile machine, N/C, small parts (Cincinnati Milling Machine) (3-15 pg 223)  
 Pump, spray (Aro) (4-15 pg 93)  
 Readout, coiled sheet (Coil-Matic) (6-15 pg 91)  
 Reducers, speed (Eaton Yale & Towne) (5-1 pg 69)  
 Roll-finisher, transmission gears (Landis Machine) (4-15 pg 91)  
 Springs, die, heavy-duty (Danly Machine) (4-1 pg 51)  
 Tester, tire (Firestone Tire & Rubber) (4-15 pg 91)  
 Testing machine (Tinius Olsen Testing Machine) (5-15 pg 87)  
 Testers, fatigue (Koehring) (3-1 pg 67)  
 Testing systems (MTS systems) (2-1 pg 70)  
 Timer, solid state (Cutler-Hammer) (2-1 pg 71)  
 Transfer lines, brake support knuckles (F. Jos. Lamb) (4-1 pg 57)

Transfer machine, connecting rods (Snyder) (5-15 pg 87)  
 Transfer machine, differential carriers (Buhr Machine Tool) (5-15 pg 83)  
 Transfer machine, disk brake calipers (Buhr Machine Tool) (2-1 pg 70)  
 Transfer machine, universal joint crosses (H. R. Kruger) (2-1 pg 71)  
 Transfer machine, water pump housings (Buhr Machine Tool) (1-1 pg 98)  
 Transmitter, fuel flow (Conoflow) (3-15 pg 223)  
 Truck, lift (Hyster) (4-1 pg 57)  
 Valve, flow control (Fluidyne Instrumentation) (5-15 pg 87)  
 Valves, control (Sperry Rand) (6-1 pg 51)  
 Valves, control, hydraulic (Componetrol) (1-15 pg 67)  
 Welder, arc, starter motor frames (Newcor) (2-15 pg 99)  
 Welder, hood panels, automatic (Conrac) (1-15 pg 71)  
 Welder, stud (Nelson Stud Welding) (2-1 pg 70)  
 Welders, compact (Taylor-Winfield) (5-15 pg 87)  
 Welding gun, portable (Falsstrom) (4-1 pg 57)  
 Worms, coiled-wire (Borg-Warner) (3-1 pg 57)  
 Wrench, impact (Power Tool) (3-15 pg 223)  
 Yarn, polyester (Celanese Fibers Marketing) (1-15 pg 69)

**NEW PRODUCTS**

Absorbers, shock (Osborn Mfg.) (4-15 pg 97)  
 Actuators, compact, high-torque (Eldyn) (6-15 pg 99)  
 Actuators, torque (Ex-Cell-O) (1-1 pg 97)  
 Adhesive, contact (Chrysler) (2-1 pg 64)  
 Adhesive, fastener (3M) (3-1 pg 59)  
 Alloy, Stainless (Cyclops) (3-1 pg 60)  
 Alternator, 75-amp (Leece-Neville) (6-1 pg 53)  
 Alternators, brushless (C. E. Niehoff) (5-15 pg 91)  
 Asbestos, controlled-swell (Armstrong Cork) (6-15 pg 101)  
 Assembly, adjustable (Superior Ball Joint) (1-1 pg 96)  
 Axles, planetary (North American Rockwell) (1-1 pg 96)  
 Axles, tubular (Southwest Wheel & Mfg.) (6-1 pg 53)  
 Bearing material, plastic base (Garlock Bearings) (3-15 pg 225)  
 Bearings, journal (Lear Siegler) (1-15 pg 73)  
 Bearings, wheel (Timken Roller Bearing) (2-1 pg 65)  
 Blender (Spraymation) (1-1 pg 97)  
 Block, die shimming (Cincinnati) (5-15 pg 91)  
 Booster, brake (Bendix) (1-1 pg 95)  
 Brake, clutch (Dana) (2-1 pg 65)  
 Calculator, electronic (Wang Laboratories) (2-15 pg 103)  
 Cap, oil filler (Moeller Mfg.) (5-1 pg 75)

Cap, radiator (AC Spark Plug) (1-15 pg 77)  
 Carburetor, horizontal (Bendix) (2-15 pg 103)  
 Clutch, heavy-duty (Dana) (1-1 pg 95)  
 Clutch, two-plate (Lipe-Rollway) (4-1 pg 61)  
 Clutch, wet (Borg-Warner) (3-1 pg 60)  
 Coating, primerless, decorative (M & T Chemicals) (2-15 pg 103)  
 Components, ignition (AMBAC Industries) (2-1 pg 65)  
 Compounds, phenolic (Union Carbide) (1-15 pg 73)  
 Connector, electrical (3M) (1-1 pg 95)  
 Controller, drive (Randtronics) (4-15 pg 95)  
 Converter, torque (Borg-Warner) (3-15 pg 225)  
 Coolant, high-volatility (Du Pont) (6-15 pg 99)  
 Cooler, transmission (Karmazin Products) (3-1 pg 59)  
 Cooling package, Diesel engines (Perflex) (6-15 pg 101)  
 Couplers, hydraulic (Prince Hydraulics) (2-15 pg 101)  
 Covering, floor, cars (Ohio Rubber) (4-1 pg 61)  
 Crank arms, self-locking screws (Superior Ball Joint) (5-15 pg 89)  
 Cylinder, air, aluminum (Integrated Dynamics) (5-15 pg 89)  
 Differential, automatic (Detroit Automotive Products) (1-1 pg 95)  
 Drill, counterbore bearings (Illinois Tool Works) (6-1 pg 53)  
 Drive, 4-wheel (Borg-Warner) (2-15 pg 101)  
 Drives, servo, all-electric (International Rectifier) (6-1 pg 53)  
 Elastomer, fluorocarbon (Acushnet) (2-15 pg 101)  
 Electrode, carbon, alloy steels (Eutectic) (6-1 pg 53)  
 Ends, rod (Superior Ball Joint) (4-1 pg 60)  
 Engine, Diesel (Waukesha Motor) (1-1 pg 97)  
 Fastener, self-locking (USM) (1-1 pg 95)  
 Fasteners, mechanical (Fastener Systems) (3-1 pg 60)  
 Filter, oil (Fram) (1-15 pg 77)  
 Foam, plastic (Plastic Systems) (1-1 pg 97)  
 Cage, in-process (Marposh Gauges) (4-15 pg 97)  
 Gasket, sealing (Thomas & Betts) (1-15 pg 73)  
 Gaskets, heavy-duty (McCord) (2-1 pg 64)  
 Harness, cable (Panduit) (2-1 pg 64)  
 Horn, plastic (Prestolite) (3-1 pg 59)  
 Ignition system (Prestolite) (2-15 pg 101)  
 Interferometer, laser (Hewlett-Packard) (6-15 pg 99)  
 Joint, exhaust (Aeroquip) (5-1 pg 75)  
 Joint assembly, ball (Superior Ball Joint) (2-1 pg 64)  
 Lacquer, foam (PPG Industries) (4-1 pg 60)

Lamps, sealed beam (GE) (4-1 pg 61)  
 Lock, door, automatic (McCord) (1-1 pg 96)  
 Locknut, reusable (Buell Industries) (2-15 pg 101)  
 Lubricant, dry-film (Acheson Colloids) (4-1 pg 60)  
 Lubricant, mill (Armco Steel) (2-15 pg 103)  
 Metal-polymers (Carborundum) (4-1 pg 60)  
 Meter, mileage (SpaceKom) (3-15 pg 225)  
 Mirror, heater (K-D Lamp) (5-1 pg 75)  
 Module, brake, clutch (Horton Mfg.) (6-15 pg 101)  
 Motor, cranking, electric (Leece-Neville) (2-1 pg 65)  
 Motor, fractional, dc drive (Brevet Products) (6-15 pg 101)  
 Motor, starter (AMBAC Industries) (5-1 pg 75)  
 Motor, transmission, hydrostatic (Sperry Rand) (6-15 pg 101)  
 Motors, vane (Sperry Rand) (4-15 pg 97)  
 Nylon (Celanese Plastics) (4-1 pg 61)  
 Nylon (DuPont) (5-15 pg 89)  
 Polyester, low profile (Reichhold Chemicals) (6-15 pg 99)  
 Polypropylene, plating (Diamond Shamrock Chemical) (5-15 pg 89)  
 Power unit, air hydraulic (Power-Packer) (5-15 pg 91)  
 Plugs, magnetic (Technical Development) (3-1 pg 60)  
 Protector, spline (Lipe-Rollway) (3-15 pg 225)  
 Pump, fuel, electric (Colt Industries) (2-15 pg 101)  
 Pump, fuel injection (Colt Industries) (4-1 pg 61)  
 Pumps, vane (Sperry Rand) (1-15 pg 77)  
 Reamers, chucking (Twentieth Century Mfg.) (5-15 pg 91)  
 Reducers, parallel shaft (Gear) (6-15 pg 99)  
 Retainer, ball-lock punch (Dayton Progress) (5-15 pg 91)  
 Retainer, wire, nylon (Tinnerman Products) (4-1 pg 60)  
 Ring, oil (Dana) (3-15 pg 225)  
 Rod end, bearing (North American Rockwell) (3-1 pg 60)  
 Screws, socket (Screw) (4-15 pg 95)  
 Seal, hub (Federal-Mogul) (2-1 pg 65)  
 Sensor, bearing temperature (Minco Products) (6-15 pg 101)  
 Sensor, motion (Roltec) (5-15 pg 89)  
 Shaft, flexible (Stow Mfg.) (1-15 pg 77)  
 Solenoids, DC (Synchro-Start Products) (5-15 pg 91)  
 Speedometer, h-d trucks (Barbour Stockwell Instruments) (3-1 pg 59)  
 Stainless, low nickel (Cyclops) (1-1 pg 95)  
 Steel, HSLA (Armco Steel) (1-1 pg 96)  
 Steel, stainless (Armco Steel) (2-1 pg 65)  
 Suspension system, heavy-duty (Reynolds Mfg.) (2-15 pg 103)

Suspension systems (Reynolds Mfg.) (4-15 pg 97)  
 Switch, limit, rugged (R. B. Denison) (4-15 pg 97)  
 Switch, transmission (Controls) (1-1 pg 97)  
 Switches, toggle (Cole-Hersee) (1-15 pg 73)  
 Tachograph, multi-function (Wagner Electric) (4-15 pg 95)  
 Terminals, wire (AMP) (2-1 pg 65)  
 Tester, hardness, metal (Tinius Olsen Testing Machine) (1-1 pg 96)  
 Thermoplastic, high impact strength (GE) (6-15 pg 99)  
 Tire, truck (Fruehauf) (1-15 pg 73)  
 Tire, truck (Goodyear Tire & Rubber) (3-1 pg 59)  
 Tire yarn, nylon (Monsanto) (2-1 pg 64)  
 Torch, heating (SmithWelding Equipment) (4-15 pg 95)  
 Transmissions, split torque (Dana) (6-1 pg 53)  
 Trim material (Allegheny Ludlum Steel) (1-1 pg 97)  
 Tubing, fittings (Imperial-Eastman) (5-15 pg 89)  
 Tubing, nylon (Polymer) (1-15 pg 77)  
 Tubing, steel (Poloron Products) (1-15 pg 77)  
 Urethane (Acushnet) (1-1 pg 97)  
 Urethane, heavy-duty (Mobay Chemical) (5-1 pg 75)  
 Valve, air shift (Omark Industries) (2-15 pg 103)  
 Washer, windshield (Sprague Devices) (1-1 pg 96)  
 Welding process (Carr Fastener) (2-15 pg 103)  
 Wiper, windshield, heated (Comstock Tool & Electric) (4-1 pg 61)

**NUMERICAL CONTROL**

Coil processing line at Chrysler (4-15 pg 75)  
 Management strategy at Chevrolet (2-1 pg 39)

—P—

**PASSENGER CARS**

See also Production

**DESIGN**

**General**

Wankel-powered Citroen M35 (5-15 pg 72)

**Components**

Powder metallurgy (6-1 pg 37)  
 Reinforced plastics (Molded Fiber Glass Body) (Smith-Inland) (2-15 pg 67)  
 Rounder wheel is here (Kelsey-Hayes) (3-1 pg 39)



**PRODUCTION**

**General**

Wixom re-visited (Ford) (2-1 pg 54)

**Components**

Chevy bumper press line (4-1 pg 40)  
 Making Cadillac's new rear axle, Part I (1-1 pg 61)  
 Making Cadillac's new rear axle, Part II (1-15 pg 47)  
 Plastic molding at Chevy-Flint (5-15 pg 69)  
 Three-layer plastic molding technique (Krauss-Maffei) (6-1 pg 45)  
 Ultrasonics at Detroit Plastic Products (6-1 pg 59)

**Engines**

"Cold" testing engines at Olds (5-1 pg 54)  
 Producing Ford's 351 CID engine, Part I (1-1 pg 66)  
 Producing Ford's 351 CID engine, Part II (1-15 pg 52)

**STATISTICS**

**Specifications**

Highlights of 1970 cars (1-1 pg 71)

**PLANTS & FACILITIES**

**NEW, CHANGES & OPERATIONS**

Chevy bumper press line (4-1 pg 40)  
 Coil processing line at Chrysler (4-15 pg 75)  
 "Cold" testing engines at Olds (5-1 pg 54)  
 Die casting Vega's block (Chevrolet) (6-15 pg 40)  
 Global concept at MF Ohio plant (6-15 pg 63)  
 Making Cadillac's new rear axle, Part I (1-1 pg 61)  
 Management strategy at Chevrolet (2-1 pg 39)  
 Olds piston pin line (2-15 pg 72)  
 Producing Ford's 351 CID engine, Part I (1-1 pg 66)  
 Ring-rolling of gear blanks (Brenco) (6-1 pg 33)  
 Wixom re-visited (Ford) (2-1 pg 54)

**PRICES**

Machine tool builders' report (2-1 pg 59)  
 Machine tool builders' report (5-1 pg 57)

**PRODUCTION**

See also Agricultural Equip., Construction Equip., Engines, Passenger Cars, and Trucks

**GENERAL**

Die casting Vega's block (Chevrolet) (6-15 pg 40)

Making Cadillac's rear axle, Part I (1-1 pg 61)  
 Producing Ford's 351 CID engine, Part I (1-1 pg 66)

**ASSEMBLY**

Ultrasonics at Detroit Plastic Products (5-1 pg 59)  
 Wixom re-visited (Ford) (2-1 pg 54)

**CASTING & MOLDING**

Plastic molding at Chevy-Flint (5-15 pg 69)  
 Three-layer plastic molding technique (Krauss-Maffei) (6-1 pg 45)

**FORMING**

Ring-rolling of gear blanks (Brenco) (6-1 pg 33)

**MACHINING**

Making Cadillac's new rear axle, Part II (1-15 pg 47)  
 Olds piston pin line (2-15 pg 72)  
 Producing Ford's 351 CID engine, Part II (1-15 pg 52)

**—R—**

**RACING (Auto)**

Indy preview, Part I (5-1 pg 43)  
 Indy preview, Part II (5-15 pg 63)  
 Registrations—See Passenger Cars, Trucks

**—S—**

**SAFETY**

GM's war on noise (3-1 pg 46)  
 Three-D safety research (Ford) (GM) (3-1 pg 54)

**SHOWS**

See also Meetings  
 SAE congress preview (1-1 pg 49)  
 SME conference and show preview (4-1 pg 49)  
 Specifications—See Agricultural Equip., Construction Equip., Engines, Marine, Passenger Cars, and Trucks  
 Sports Cars—See Passenger Cars

**SUSPENSION SYSTEMS & COMPONENTS**

Wankel-powered Citroen M35 (5-15 pg 72)

**—T—**

Tanks—See Military Equip. & Activities

**TESTING**

"Cold" testing engines at Olds (5-1 pg 54)  
 Cordless tire (Firestone Tire & Rubber) (5-1 pg 67)  
 Making Cadillac's new rear axle, Part I (1-1 pg 61)  
 Producing Ford's 351 CID engine, Part I (1-1 pg 66)  
 Three-D safety research (Ford) (GM) (3-1 pg 54)  
 Wixom re-visited (Ford) (2-1 pg 54)

**TIRES**

Cordless tire (Firestone Tire & Rubber) (4-15 pg 67)  
 Wire cord belt developments (Firestone Tire & Rubber) (3-1 pg 41)

**TRANSMISSIONS**

See also Agricultural Equip., Buses, Construction Equip., Marine, Passenger Cars, and Trucks

**DESIGN**

Hydrostatic  
 Hydrostatic traction drives (Sperry Rand) (2-15 pg 61)

**TRUCKS**

**DESIGN**

**General**

200-ton truck (GM) (Unit Rig & Equipment) (6-15 pg 47)

**Components**

Anti-jackknife braking system (Bendix-Westinghouse) (5-15 pg 74)  
 Axles for highway 4 x 4 tractor (North American Rockwell) (abstract) (3-1 pg 35)

**Engines**

Truck turbine drive (Dana) (4-1 pg 35)

**—U—**

**ULTRASONICS**

See also Testing, Welding  
 Ultrasonics at Detroit Plastic Products (5-1 pg 59)  
 Unions—See Associations & Organizations

**—W—**

**WELDING**

Ultrasonics at Detroit Plastic Products (5-1 pg 59)

**AUTHORS**

**—B—**

BARCLAY, HARTLEY W.  
 Industry in the '70s decade (1-15 pg 41)  
 The "over forty" manufacturing engineer (Editorial) (1-15 pg 39)  
 1970 — The dismal outlook? (Editorial) (1-1 pg 59)

**—C—**

CALLAHAN, JOSEPH M.  
 Cordless tire (Firestone Tire & Rubber) (4-15 pg 67)  
 GM's war on noise (3-1 pg 46)  
 Management at AMC (4-1 pg 42)  
 Rounder wheel is here (Kelsey-Hayes) (3-1 pg 39)  
 CALLUM, C. L.  
 Latest tractors from Allis-Chalmers (6-15 pg 53)  
 CHERMAK, MICHAEL A.  
 Improving hose and tube assemblies (ITE Imperial) (1-15 pg 57)

**—E—**

ESHELMAN, R. H.  
 Die casting Vega's block (Chevrolet) (6-15 pg 40)  
 Global concept at MF Ohio plant (6-15 pg 63)  
 LP gas conversion (5-15 pg 59)  
 Three-D safety research (Ford) (GM) (3-1 pg 54)  
 Truck turbine drive (Dana) (4-1 pg 35)  
 Wire cord belt developments (Firestone Tire & Rubber) (3-1 pg 41)  
 EGER, GEORGE W.  
 Material . . . the common denominator, Part I (I-H) (4-15 pg 71)  
 Material . . . the common denominator, Part II (I-H) (5-1 pg 49)

**—G—**

GESCHELIN, JOSEPH  
 Anti-jackknife braking system (Bendix-Westinghouse) (5-15 pg 74)  
 Chevy bumper press line (4-1 pg 40)  
 Coil processing line at Chrysler (4-15 pg 75)  
 Making Cadillac's new rear axle, Part I (1-1 pg 61)

Making Cadillac's new rear axle, Part II (1-15 pg 47)  
 Management strategy at Chevrolet (1-1 pg 39)  
 New bearings increase load capacity (Federal-Mogul) (6-1 pg 42)  
 Olds piston pin line (2-15 pg 72)  
 Plastic molding at Chevy-Flint (5-15 pg 69)  
 Producing Ford's 351 CID engine, Part I (1-1 pg 66)  
 Producing Ford's 351 CID engine, Part II (1-15 pg 52)  
 Unleaded fuel (Standard Oil) (4-15 pg 83)  
 Wixom re-visited (Ford) (2-1 pg 54)  
 GLASER, MARCUS  
 French military vehicles (2-15 pg 78)

—K—

KAY, R. RAYMOND  
 Indy preview, Part I (5-1 pg 43)  
 Indy preview, Part II (5-15 pg 63)

—L—

LLOYD, NORMAN M.  
 Custer's last stand (Editorial) (2-15 pg 59)  
 The corporate purple (Editorial) (6-15 pg 45)  
 Detroit: Spring and the robins (Editorial) (5-1 pg 41)  
 The engine of inflation (Editorial) (5-15 pg 57)  
 Japan (Editorial) (6-1 pg 31)  
 PR: The dark edge of know-nothingism? (Editorial) (4-1 pg 33)  
 Paging the consumer (Editorial) (4-15 pg 65)  
 Perceive the new (Editorial) (3-15 pg 57)  
 Predetermined effort (Editorial) (2-1 pg 37)  
 A program with a bite (Editorial) (3-1 pg 33)  
 Reinforced plastics (Molded Fiber Glass Body) (Smith-Indland) (2-15 pg 67)

—M—

MILLER, J. V.  
 Hydrostatic traction drives (Sperry Rand) (2-15 pg 61)

—N—

NELSON, HAROLD M.  
 Highlights of 1970 cars (1-1 pg 71)

—P—

PANNY, WM. P.  
 Axles for highway 4 x 4 tractor (North American Rockwell) (abstract) (3-1 pg 35)

—R—

REDDY, PAUL A.  
 Farm and construction equipment industries (6-15 pg 66)  
 REID, MORRIS W.  
 Hydraulics in construction field (6-15 pg 55)  
 RIDDLE, ARNOLD K.  
 Axles for highway 4 x 4 tractor (North American Rockwell) (abstract) (3-1 pg 35)

—S—

SCOTT, DAVID  
 European Round-up (1-15 pg 35) (3-1 pg 29) (3-15 pg 234) (4-15 pg 41) (5-15 pg 51) (6-15 pg 41)  
 Wankel-powered Citroen M35 (5-15 pg 72)  
 STEVENS, R. E.  
 Hydrostatic traction drives (Sperry Rand) (2-15 pg 61)  
 STROUP, CURRY W.  
 Farm machinery in the 70s (6-15 pg 50)

—W—

WEINERT, CHARLES A.  
 Machine tool builders' report (2-1 pg 59)  
 Machine tool builders' report (5-1 pg 57)  
 Marine engines for 1970, Part I ... Outboard motors (2-1 pg 49)  
 Marine engines for 1970, Part II ... Outboard motors (2-15 pg 74)  
 Marine engines for 1970, Part III ... Inboard engines (3-1 pg 49)

Marine engines for 1970, Part IV ... Inboard engines (4-1 pg 43)  
 Marine engines for 1970, Part V ... Inboard engines (4-15 pg 77)  
 News of the Machinery Industries (2-15 pg 85) (3-15 pg 240)  
 Power trains ... construction vehicles (Caterpillar Tractor) (6-15 pg 58)  
 Recreational boating soars (2-1 pg 46)  
 Ring-rolling of gear blanks (Brenco) (6-1 pg 33)

COMPANIES

—A—

AC SPARK PLUG DIV., GM CORP.  
 Cap, radiator (1-15 pg 77)  
 AMBAC INDUSTRIES, INC.  
 Components, ignition (2-1 pg 65)  
 Motor, starter (5-1 pg 75)  
 AMF VERSATRAN  
 Control systems, robot (4-1 pg 51)  
 AMP, INC.  
 Assembly machine (2-1 pg 71)  
 Terminals, wire (2-1 pg 65)  
 ACHESON COLLOIDS CO.  
 Lubricant, dry-film (4-1 pg 60)  
 ACUSHNET CO.  
 Elastomer, fluorocarbon (2-15 pg 101)  
 Urethane (1-1 pg 97)  
 AEROQUIP CORP.  
 Joint, exhaust (5-1 pg 75)  
 ALLEGHENY LUDLUM STEEL CORP.  
 Trim material (1-1 pg 97)  
 ALLEN-BRADLEY CO.  
 Controller (1-15 pg 67)  
 ALLIED RESEARCH PRODUCTS, INC.  
 Plating system (1-15 pg 67)  
 ALLIS-CHALMERS MFG. CO.  
 Latest tractors from Allis-Chalmers (6-15 pg 53)  
 AMERICAN MOTORS CORP.  
 Management at AMC (4-1 pg 42)

APPLIED POWER INDUSTRIES, INC.  
 Presses, hydraulic (5-15 pg 83)  
 ARMCO STEEL CORP.  
 Lubricant, mill (2-15 pg 103)  
 Steel, HSLA (1-1 pg 96)  
 Steel, stainless (2-1 pg 65)  
 ARMSTRONG CORK CO.  
 Asbestos, controlled-swell (6-15 pg 101)

ARO CORP.  
 Pump, spray (4-15 pg 93)  
 AVNET, INC.  
 Casting process, ceramic molds (4-1 pg 50)

—B—

BARBOUR STOCKWELL INSTRUMENTS  
 Speedometer, h-d trucks (3-1 pg 59)  
 BENDIX-AEROSPACE-ELECTRONICS CO.  
 Drafting system, automated (4-15 pg 93)  
 BENDIX AUTOMOTIVE & AUTOMATION  
 Gage, engine timing (6-15 pg 93)  
 BENDIX CORP.  
 Booster, brake (1-1 pg 95)  
 Carburetor, horizontal (2-15 pg 103)  
 BENDIX-WESTINGHOUSE CORP.  
 Anti-jackknife braking system (5-15 pg 74)  
 BORG-WARNER CORP.  
 Clutch, wet (3-1 pg 60)  
 Converter, torque (3-15 pg 225)  
 Drive, 4-wheel (2-15 pg 101)  
 Hard-facing process (3-1 pg 58)  
 Worms, coiled-wire (3-1 pg 57)  
 BRANSON INSTRUMENTS CO.  
 Gage, thickness (1-15 pg 69)  
 BREMEN BEARING CO.  
 Gages, bearing, alternator, plastic (1-15 pg 62)  
 BRENCO, INC.  
 Ring-rolling of gear blanks (6-1 pg 33)  
 BRELVI PRODUCTS CORP.  
 Motor, fractional, dc drive (6-15 pg 101)  
 BRYANT GRINDER CORP.  
 Grinder, automotive transmission gears (4-1 pg 57)  
 Grinder, internal, power steering parts (3-1 pg 58)  
 BUELL INDUSTRIES  
 Locknut, reusable (2-15 pg 101)  
 BUHR MACHINE TOOL CORP.  
 Finisher, steering knuckle part (1-15 pg 71)  
 Transfer machine, differential carriers (5-15 pg 83)  
 Transfer machine, disk brake calipers (2-1 pg 70)  
 Transfer machine, water pump housings (1-1 pg 98)

—C—

CADILLAC MOTOR CAR DIV., GM CORP.  
 Making Cadillac's new rear axle, Part II (1-15 pg 47)  
 Making Cadillac's new rear axle, Part II (1-15 pg 47)

# AUTOMOTIVE INDUSTRIES—INDEX

January 1 to June 15, 1970

**CARBORUNDUM CO.**  
Metal/polymers (4-1 pg 60)

**CARR FASTENER CO.**  
Welding process (2-15 pg 103)

**CATERPILLAR TRACTOR CO.**  
Power trains . . . construction vehicles (6-15 pg 58)

**CELANESE FIBERS MARKETING CO.**  
Yarn, polyester (1-15 pg 69)

**CELANESE PLASTICS CO.**  
Nylon (4-1 pg 61)

**CERRO COPPER & BRASS CO.**  
Body, 5-way valve (5-1 pg 67)

**CHEVROLET MOTOR DIV., GM CORP.**  
Chevy bumper press line (4-1 pg 40)  
Die casting Vega's block (5-15 pg 40)  
Management strategy at Chevrolet (2-1 pg 39)  
Plastic molding at Chevy-Flint (5-15 pg 69)

**CHRYSLER CORP.**  
Adhesive, contact (2-1 pg 64)  
Coil processing line at Chrysler (4-15 pg 75)

**CINCINNATI, INC.**  
Block, die shimming (5-15 pg 91)

**CINCINNATI MILLING MACHINE CO.**  
Chucking center, N/C (4-1 pg 50)  
Indexing, variable (5-15 pg 87)  
Machining center, control system (5-1 pg 69)  
Profile machine, N/C, small parts (3-15 pg 223)

**CITROEN (FRANCE)**  
Wankel-powered Citroen M35 (5-15 pg 72)

**CLEERMAN MACHINE TOOL CO.**  
Machining center, N/C (3-15 pg 223)

**CLEVELAND TWIST DRILL CO.**  
Holder, end mill (3-1 pg 57)

**COIL-MATIC, INC.**  
Readout, coiled sheet (6-15 pg 91)

**COLE-HERSEE CO.**  
Switches, toggle (1-15 pg 73)

**COLT INDUSTRIES**  
Pump, fuel, electric (2-15 pg 101)  
Pump, fuel injection (4-1 pg 61)

**COMOTOR (SA) (LUXEMBOURG)**  
Wankel-powered Citroen M35 (5-15 pg 72)

**COMPO INDUSTRIES, INC.**  
Molding machine, injection, auto parts (3-1 pg 57)

**COMPONETROL, INC.**  
Valves, control, hydraulic (1-15 pg 67)

**COMSTOCK TOOL & ELECTRIC CO.**  
Wiper, windshield, heated (4-1 pg 61)

**CONOFLOW CORP.**  
Transmitter, fuel flow (3-15 pg 223)

**CONRAC CORP.**  
Welder, hood panels, automatic (1-15 pg 71)

**CONTROLS CO. OF AMERICA**  
Switch, transmission (1-1 pg 97)

**CUTLER-HAMMER**  
Timer, solid state (2-1 pg 71)

**CYCLOPS CORP.**  
Alloy, stainless (3-1 pg 60)  
Stainless, low nickel (1-1 pg 95)

## —D—

**DANA CORP.**  
Brake, clutch (2-1 pg 65)  
Clutch, heavy-duty (1-1 pg 95)  
Ring, oil (3-15 pg 225)  
Transmissions, split torque (6-1 pg 53)  
Truck turbine drive (4-1 pg 35)

**DANLY MACHINE CORP.**  
Springs, die, heavy-duty (4-1 pg 51)

**DAYTON PROGRESS CORP.**  
Retainer, ball-lock punch (5-15 pg 91)

**DENISON, R. B., INC.**  
Switch, limit, rugged (4-15 pg 97)

**DETROIT AUTOMOTIVE PRODUCTS CORP.**  
Differential, automatic (1-1 pg 95)

**DETROIT PLASTICS PRODUCTS CO.**  
Ultrasonics at Detroit Plastic Products (5-1 pg 59)

**DeVlieg Machine Co.**  
Jigmill, heavy roughing cuts (6-15 pg 91)

**DIAMOND SHAMROCK CHEMICAL CO.**  
Polypropylene, plating (5-15 pg 89)

**DOTCO, INC.**  
Grinders (2-1 pg 71)

**DU PONT CO.**  
Coolant, high-volatility (6-15 pg 99)  
Nylon (5-15 pg 89)

## —E—

**EATON YALE & TOWNE, INC.**  
Gun system, fastener (2-15 pg 99)  
Reducers, speed (5-1 pg 69)

**EFDYN CORP.**  
Actuators, compact, high-torque (6-15 pg 99)

**EUTECTIC CORP.**  
Electrode, carbon, alloy steels (6-1 pg 53)

**EX-CELL-O CORP.**  
Actuators, torque (1-1 pg 97)  
Gage, connecting rod (4-15 pg 93)  
Gage, steering assemblies (6-15 pg 91)  
Honer, engine block bearing bores (2-1 pg 70)

## —F—

**FALSTROM CO.**  
Welding gun, portable (4-1 pg 57)

**FARMINGTON, INC.**  
Cutter, milling (6-15 pg 93)

**FASTENER SYSTEMS CORP.**  
Fasteners, mechanical (3-1 pg 60)

**FEDERAL-MOGUL CORP.**  
New bearings increase load capacity (6-1 pg 42)  
Seal, hub (2-1 pg 65)

**FIRESTONE TIRE & RUBBER CO.**  
Cordless tire (4-15 pg 67)  
Tester, tire (4-15 pg 91)  
Wire cord belt developments (3-1 pg 41)

**FLUIDYNE INSTRUMENTATION**  
Valve, flow control (5-15 pg 87)

**FORD MOTOR CO.**  
Producing Ford's 351 CID engine, Part I (1-1 pg 66)  
Producing Ford's 351 CID engine, Part II (1-15 pg 52)  
Three-D safety research (3-1 pg 54)  
Wixom re-visited (2-1 pg 54)

**FRAM CORP.**  
Filter, oil (1-15 pg 77)

**FRUEHAUF CORP.**  
Tire, truck (1-15 pg 73)

## —G—

**GARLOCK BEARINGS, INC.**  
Bearing material, plastic base (3-15 pg 225)

**GEAR CORP.**  
Reducers, parallel shaft (6-15 pg 99)

**GENERAL ELECTRIC CO.**  
Lamps, sealed beam (4-1 pg 61)  
Polyimides (4-15 pg 91)  
Thermoplastic, high impact strength (6-15 pg 99)

**GENERAL MOTORS CORP.**  
GM's war on noise (3-1 pg 46)  
Insert, distributor cap, cold headed (1-15 pg 62)  
Three-D safety research (3-1 pg 54)  
200-ton truck (6-15 pg 47)

**GLEASON WORKS**  
Arbor (2-1 pg 71)

**GOODYEAR TIRE & RUBBER CO.**  
Tire, truck (3-1 pg 59)

**GOULD, INC.**  
Analyzer, surface (4-15 pg 91)

## —H—

**HEALD MACHINE CO.**  
Control system, N/C (1-15 pg 69)

**HEWLETT-PACKARD CO.**  
Interferometer, laser (6-15 pg 99)

**HORTON MFG. CO.**  
Module, brake, clutch (6-15 pg 101)

**HUNTER DOUGLAS MACHINERY CORP.**  
Boring mill, horizontal (4-1 pg 51)

**HYSTER CO.**  
Truck, lift (4-1 pg 57)

## —I—

**ITE IMPERIAL CORP.**  
Improving hose and tube assemblies (1-15 pg 57)

**ILLINOIS TOOL WORKS, INC.**  
Drill, counterbore bearings (6-1 pg 53)

**IMPERIAL-EASTMAN**  
Tubing, fittings (5-15 pg 89)

**INTEGRATED DYNAMICS**  
Cylinder, air, aluminum (5-15 pg 89)

**INTERNATIONAL HARVESTER CO.**  
Material . . . the common denominator, Part I (4-15 pg 71)  
Material . . . the common denominator, Part II (5-1 pg 49)

**INTERNATIONAL RECTIFIER, CROYDON CONTROLS DIV.**  
Drives, servi, all-electric (6-1 pg 53)

## —K—

**K-D LAMP CO.**  
Mirror, heater (5-1 pg 75)

**KARMAZIN PRODUCTS CORP.**  
Cooler, transmission (3-1 pg 59)

**KELSEY-HAYES CORP.**  
Rounder wheel is here (3-1 pg 39)

**KOEHRING CO.**  
Testers, fatigue (5-1 pg 67)

**KRAUSS-MAFFEI CORP.**  
Three-layer plastic molding technique (6-1 pg 45)

**KRUGER, H. R. CO.**  
Transfer machine, universal joint crosses (2-1 pg 71)

## —L—

**LAMB, F. JOS. CO.**  
Differential casing holes machines (1-15 pg 69)  
Transfer lines, brake support knuckles (4-1 pg 57)

- LANDIS MACHINE CO.**  
Roll-finisher, transmission gears (4-15 pg 91)
- LEAR SIEGLER, INC.**  
Bearings, journal (1-15 pg 73)
- LEBANON STEEL FOUNDRY**  
Autoform, casting, forging (4-1 pg 52)
- LeBLOND, INC.**  
Drill, N/C (6-15 pg 93)
- LEECE-NEVILLE CO.**  
Alternator, 75-amp (6-1 pg 53)  
Motor, cranking, electric (2-1 pg 65)
- LINCOLN IND. CO.**  
Electrical discharge machine (6-1 pg 51)
- LIPE-ROLLWAY CORP.**  
Clutch, two-plate (4-1 pg 61)  
Protector, spline (3-15 pg 225)
- LOCTITE CORP.**  
Liners, cylinder, adhesive bonded, military (1-15 pg 63)
- M—
- M & T CHEMICALS, INC.**  
Coating, primerless, decorative (2-15 pg 103)
- MTS SYSTEMS CORP.**  
Testing systems (2-1 pg 70)
- MARPOSS GAUGES CORP.**  
Gage, in-process (4-15 pg 97)
- MASSEY-FERGUSON, INC.**  
Global concept at MF Ohio plant (6-15 pg 63)
- McCORD CORP.**  
Gaskets, heavy-duty (2-1 pg 64)  
Lock, door, automatic (1-1 pg 96)
- MINCO PRODUCTS, INC.**  
Sensor, bearing temperature (6-15 pg 101)
- MOBAY CHEMICAL CO.**  
Urethane, heavy-duty (5-1 pg 75)
- MOELLER MFG. CO.**  
Cap, oil filler (5-1 pg 75)
- MOLDED FIBER GLASS BODY CO.**  
Reinforced plastics (2-15 pg 67)
- MONSANTO CO.**  
Tire yarn, nylon (2-1 pg 64)
- N—
- NSU (GERMANY)**  
Wankel-powered Citroen M35 (5-15 pg 72)
- NELSON STUD WELDING CO.**  
Welder, stud (2-1 pg 70)
- NEWCOR, INC.**  
Assembly machine, wheel backing plate (1-1 pg 98)  
Welder, arc, starter motor frames (2-15 pg 99)
- NIAGARA MACHINE & TOOL WORKS**  
Press, OBI (3-1 pg 57)
- NIEHOFF, C. E. & CO.**  
Alternators, brushless (5-15 pg 91)
- NORDSON CORP.**  
Applicator, adhesive, hot melt (2-15 pg 99)
- NORTH AMERICAN ROCKWELL CORP.**  
Axles, planetary (1-1 pg 96)  
Axles for highway 4 x 4 tractor (abstract) (3-1 pg 35)  
Rod end, bearing (3-1 pg 60)
- O—
- OHIO RUBBER CO.**  
Covering, floor, cars (4-1 pg 61)
- OLDSMOBILE DIV., GM CORP.**  
"Cold" testing engines at Olds (5-1 pg 54)  
Olds piston pin line (2-15 pg 72)
- OLSON LABORATORIES, INC.**  
Analyzer, hydrocarbon (3-1 pg 58)
- OMARK INDUSTRIES**  
Valve, air shift (2-15 pg 103)
- OSBORN MFG. CO.**  
Absorbers, shock (4-15 pg 97)
- P—
- PPG INDUSTRIES**  
Lacquer, foam (4-1 pg 60)
- PANDUIT CORP.**  
Harness, cable (2-1 pg 64)
- PARKER HANNIFIN CORP.**  
Cylinder, test autos (4-1 pg 54)  
Hose, fittings (5-1 pg 67)
- PENNWALT CORP.**  
Press, encapsulation (5-1 pg 67)
- PERFEX CORP.**  
Cooling package, Diesel engines (6-15 pg 101)
- PINES ENGINEERING CO.**  
Bender, tube, hydraulic (6-1 pg 51)
- PLASTIC SYSTEMS CORP.**  
Foam, plastic (1-1 pg 97)
- POLORON PRODUCTS INC.**  
Tubing, steel (1-15 pg 77)
- POLYMER CORP.**  
Tubing, nylon (1-15 pg 77)
- POWER-PACKER**  
Power unit, air hydraulic (5-15 pg 91)
- POWER TOOL CO.**  
Wrench, impact (3-15 pg 223)
- PRESTOLITE CO.**  
Horn, plastic (3-1 pg 59)  
Ignition system (2-15 pg 101)
- PRINCE HYDRAULICS**  
Couplers, hydraulic (2-15 pg 101)
- R—
- RCA INDUSTRIAL & AUTOMATION SYSTEMS**  
Gaging, testing system, steering knuckle hardness (1-15 pg 67)
- RAND-TRONICS, INC.**  
Controller, drive (4-15 pg 95)
- REICHOLD CHEMICALS, INC.**  
Polyester, low profile (6-15 pg 99)
- REYNOLDS MFG. CO.**  
Suspension system, heavy-duty (2-15 pg 103)  
Suspension systems (4-15 pg 97)
- ROLTEC, INC.**  
Sensor, motion (5-15 pg 89)
- S—
- SCREW CORP.**  
Screws, socket (4-15 pg 95)
- SERVICE MACHINE CO.**  
Presses (4-1 pg 50)
- SMITH-INLAND CO.**  
Reinforced plastics (2-15 pg 67)
- SMITH WELDING EQUIPMENT**  
Torch, heating (4-15 pg 95)
- SNYDER CORP.**  
Index machines, rotary, Diesel piston crossheads (5-1 pg 69)  
Transfer machine, connecting rods (5-15 pg 87)
- SOUTHWEST WHEEL & MFG. CO.**  
Axles, tubular (6-1 pg 53)
- SPACEKOM, INC.**  
Meter, mileage (3-15 pg 225)
- SPERRY RAND CORP.**  
Hydrostatic traction drives (2-15 pg 61)  
Motor, transmission, hydrostatic (6-15 pg 101)  
Motors, vane (4-15 pg 97)  
Pumps, vane (1-15 pg 77)  
Valves, control (6-1 pg 51)
- SPRAGUE DEVICES, INC.**  
Washer, windshield (1-1 pg 96)
- SPRAYMATION, INC.**  
Blender (1-1 pg 97)
- STANDARD OIL CO.**  
Unleaded fuel (4-15 pg 83)
- STANDARD TOOL & MFG. CO.**  
Converter, motion (5-15 pg 83)
- STOW MFG. CO.**  
Coupling, flexible (5-1 pg 69)  
Shaft, flexible (1-15 pg 77)
- SUPERIOR BALL JOINT CO.**  
Assembly, adjustable (1-1 pg 96)  
Crank arms, self-locking screws (5-15 pg 89)  
Ends, rod (4-1 pg 60)  
Joint assembly, ball (2-1 pg 64)
- SYNCHRO-START PRODUCTS, INC.**  
Solenoids, DC (5-15 pg 91)
- T—
- TRW, INC.**  
Welding, stud, instrument panel supports (4-1 pg 52)
- TAYLOR-WINFIELD CORP.**  
Welders, compact (5-15 pg 87)
- TECHNICAL DEVELOPMENT CO.**  
Plugs, magnetic (3-1 pg 60)
- TEXACO, INC.**  
Grease, metals, heavy industries (2-15 pg 99)
- THOMAS & BETTS CO.**  
Gasket, sealing (1-15 pg 73)
- 3M CO.**  
Adhesive, fastener (3-1 pg 59)  
Connector, electrical (1-1 pg 95)
- TIMKEN ROLLER BEARING CO.**  
Bearings, wheel (2-1 pg 65)
- TINIUS OLSEN TESTING MACHINE CO.**  
Tester, hardness, metal (1-1 pg 96)  
Testing machine (5-15 pg 87)
- TINNERMAN PRODUCTS, INC.**  
Retainer, wire, nylon (4-1 pg 60)
- TWENTIETH CENTURY MFG. CO.**  
Reamers, chucking (5-15 pg 91)
- U—
- U.S. DRILL HEAD CO.**  
Drill head, no repositioning (6-15 pg 91)
- U.S. INDUSTRIES, INC.**  
Molding machine, compression (3-1 pg 58)
- USM CHEMICAL CO.**  
Net adhesive, upholstery bonding (1-15 pg 64)
- USM FASTENER CO.**  
Fastener, self-locking (1-1 pg 95)
- UDYLITE CORP.**  
Brightener, plating (1-1 pg 98)  
Plating process (1-15 pg 71)
- UNIT RIG & EQUIPMENT CO.**  
200-ton truck (6-15 pg 47)
- UNION CARBIDE CORP.**  
Compounds, phenolic (1-15 pg 73)
- V—
- VAN DORN PLASTIC MACHINERY CO.**  
Molding machine, injection (6-1 pg 51)
- W—
- WAGNER ELECTRIC CORP.**  
Tachograph, multi-function (4-15 pg 95)
- WANG LABORATORIES, INC.**  
Calculator, electronic (2-15 pg 103)
- WAUKESHA MOTOR CO.**  
Engine, diesel (1-1 pg 97)
- WESTINGHOUSE ELECTRIC CORP.**  
Numerical control, program (5-15 pg 83)
- WHEELABRATOR CORP.**  
Cutters, T-slot (6-15 pg 93)
- WICKMAN CORP.**  
Honing, diamond (4-1 pg 50)
- X—
- X-4 CORP.**  
Control, torque (1-15 pg 71)



# **AUTOMOTIVE INDUSTRIES**

---

Published Semi-Monthly

## **INDEX**

**Volume 143**

**July 1 to December 15**

**1970**

Articles by Subject .....	Page 2
Authors .....	Page 6
Companies .....	Page 6

**CHILTON COMPANY, PHILADELPHIA, PA. 19139**

—A—

**ABSTRACTS**

Engineering the Porsche car, Part I (11-1 pg 71)  
Engineering the Porsche car, Part II (11-15 pg 54)

**AGRICULTURAL EQUIP.**

**DESIGN**  
Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
Assembly—See Production

**ASSOCIATIONS AND ORGANIZATIONS**

See also Government Agencies & Activities & Meetings  
Electron beams and lasers (WS) (Union Carbide) (8-1 pg 46)  
Linear motor impact tests (MIRA) (7-15 pg 39)  
Machine tool show preview (NMTB) (9-1 pg 64)  
Perilous pact (Editorial) (UAW) (12-1 pg 33)  
Recreational vehicles (ISA) (7-15 pg 25)

**AUTOMATION**

Automation plus at Lordstown (10-1 pg 40)  
Gear cutter has novel design (Sipco Machine) (10-15 pg 65)  
Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)

—B—

**BEARINGS**

Federal-Mogul ideas (7-15 pg 43)  
Boats—See Marine

**BRAKES**

Anti-skid unit hailed (Bendix) (Chrysler) (10-15 pg 18)  
Anti-spin device for '71 (GM) (10-1 pg 33)  
Brake shoe assembly at GM (9-1 pg 22)  
Brake tubing (Bundy) (10-15 pg 63)  
Range Rover station wagon (British Leyland Motor) (10-15 pg 67)

—C—

**CASTING & MOLDING**

See also Production  
New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)  
Plastic body panels near (U.S. Industries) (Oldsmobile) (7-15 pg 25)  
SMC plastic (Houdaille Industries) (10-15 pg 58)

**CHEMICALS & COMPOUNDS**

See also New Developments  
Dow Chemical fills cooling gap (8-15 pg 53)

**COMPUTERS**

Anti-spin device for '71 (GM) (10-1 pg 33)  
Automation plus at Lordstown (10-1 pg 40)  
Brake shoe assembly at GM (9-1 pg 22)  
Computer controlled machining (Ex-Cell-O) (7-15 pg 51)  
Ford's Louisville truck complex (9-15 pg 18)  
Scania's new assembly plant, Part I (Saab-Scania) (11-1 pg 38)

**CONSTRUCTION EQUIP. ENGINES**

New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)

**CONTROLS**

Anti-skid unit hailed (Bendix) (Chrysler) (10-15 pg 18)  
Brake shoe assembly at GM (9-1 pg 22)  
Computer controlled machining (Ex-Cell-O) (7-15 pg 51)  
Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)

**CONTRACTS**

Army seeking Scout vehicle (12-1 pg 39)  
Testing Twister SM 808 (Lockheed Missiles & Space) (12-1 pg 43)  
Conventions—See Meetings

**COOLING SYSTEM**

Dow Chemical fills cooling gap (8-15 pg 53)

**COST**

Engineering the Porsche car, Part I (11-1 pg 34)  
Ford: a shift in materials (8-1 pg 48)  
New vehicle speeds army's mobility (Pacific Car & Foundry) (12-1 pg 35)

—D—

Design—See Engines, Marine, Passenger Cars, Trucks  
Diesel Engines—See Engines

—E—

**ELECTRONICS & ELECTRICAL EQUIP.**

See also New Developments  
Ford's Louisville truck complex (9-15 pg 18)

**EMPLOYMENT**

Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)  
Quality control, Part IV (Chrysler) (11-15 pg 24)

**ENGINES**

See also Agricultural Equip., Construction Equip., Passenger Cars, and Trucks

**DESIGN**

**Reciprocating**  
Engineering the Porsche car, Part I (11-1 pg 34)  
Engines '71: getting them to church (10-1 pg 45)  
Mid-engine flood due? (GM) (Ford) (AMC) (7-15 pg 18)  
New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)  
Range Rover station wagon (British Leyland Motor) (10-15 pg 67)

**PRODUCTION**

**Reciprocating**  
Engine cylinder liners treatment at TRW (8-1 pg 40)

**Other**

Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
Exhibit—See shows

—F—

**FASTENING**

Power tools, Part III (Ingersoll-Rand) (11-15 pg 45)

**FOREIGN BUSINESS ACTIVITIES**

British Leyland studies family car (7-1 pg 54)  
Engineering the Porsche car, Part I (11-1 pg 34)  
Engineering the Porsche car, Part II (11-15 pg 54)  
European Round-up (7-15 pg 27) (8-15 pg 28) (9-15 pg 24) (10-15 pg 24) (11-15 pg 28) (12-15 pg 24)  
French export 56% of cars (Simca) (7-1 pg 59)  
Lead-free gasoline (Ford) (8-1 pg 33)  
Linear motor impact tests (7-15 pg 39)  
Mid-engine flood due? (GM) (Ford) (AMC) (7-15 pg 18)  
Output for 1969 sagged . . . foreign production rose (7-1 pg 66)  
Range Rover station wagon (British Leyland Motor) (10-15 pg 67)  
Scania's new assembly plant, Part I (11-1 pg 38)  
Scania's new assembly plant, Part II (11-15 pg 50)  
U. S. Japanese trade (7-1 pg 62)  
U. S. production equipment overseas (7-15 pg 45)  
VW Super Beetle (11-1 pg 43)

**FUEL**

Engine cylinder liners treatment at TRW (8-1 pg 40)

**FUEL SYSTEMS & COMPONENTS**

See also New Developments  
Lead-free gasoline (Ford) (8-1 pg 33)

—G—

**GEARS**

See also Agricultural Equip., Construction Equip., Marine, New Developments, Passenger Cars, and Trucks  
Gear cutter has novel design (Sipco Machine) (10-15 pg 65)

**GOVERNMENT AGENCIES & ACTIVITIES**

See also Associations & Organizations  
The metric system (Perkins Engines) (11-15 pg 22)  
Recreational vehicles (7-15 pg 25)  
Washington Report (7-1 pg 45) (8-1 pg 26) (9-1 pg 28) (10-1 pg 24) (11-1 pg 24) (12-1 pg 28)

—H—

**HAND TOOLS**

Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)  
Power tools, Part II (Ingersoll-Rand) (11-1 pg 29)  
Power tools, Part III (Ingersoll-Rand) (11-15 pg 45)

**HEAT TREATING**

See also Metallurgy and Production  
Engine cylinder liners treatment at TRW (8-1 pg 40)  
Superior formability with titanium steels (Youngstown Sheet & Tube) (11-1 pg 46)

**HYDRAULICS & PNEUMATICS**

Plastic body panels near (U.S. Industries) (Oldsmobile) (7-15 pg 25)

—I—

Inspection—See Production

—L—

**LEGISLATION**

Evaporative emissions controls (10-15 pg 60)

**LUBRICATION & LUBRICANTS**

Power tools, Part II (Ingersoll-Rand) (11-1 pg 29)

—M—

**MACHINE TOOLS**

See also New Developments and Production

**GENERAL**

Automation plus at Lordstown (10-1 pg 40)  
Brake shoe assembly at GM (9-1 pg 22)  
Computer controlled machining (Ex-Cell-O) (7-15 pg 51)  
Electron beams and lasers (Union Carbide) (8-1 pg 46)  
Gear cutter has novel design (Sipco Machine) (10-15 pg 65)  
Linear motor impact tests (7-15 pg 39)  
Machine tool show preview (9-1 pg 64)  
Making production pay in the 1970's (Sundstrand) (9-1 pg 35)  
Plastic body panels near (U. S. Industries) (Oldsmobile) (7-15 pg 25)  
Production engineering show preview (9-1 pg 72)  
Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)  
U. S. production equipment overseas (7-15 pg 45)  
Machining—See Production

**MANAGEMENT**

See also Associations, Organizations, Government Agencies & Activities  
British Leyland studies family car (7-1 pg 54)  
Quality control, Part I (Chrysler) (10-1 pg 37)  
Quality control, Part II (Cadillac) (10-15 pg 20)  
Quality control, Part III (Ford) (11-1 pg 21)  
Quality control, Part IV (Chrysler) (11-15 pg 24)  
Quality control, Part V (Chevrolet) (12-1 pg 25)  
Quality control, Part VI (AMC) (12-15 pg 22)  
SMC plastic (Houdaille Industries) (10-15 pg 58)  
Volkswagen of America (7-1 pg 51)

**MARINE ENGINES**

New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)

**MARKETING**

British Leyland studies family car (7-1 pg 54)  
French export 56% of cars (Simca) (7-1 pg 59)  
Recreational vehicles (7-15 pg 35)

SMC plastic (Houdaille Industries) (10-15 pg 58)  
U.S. Japanese trade (7-1 pg 62)

**MATERIALS**

See also New Developments

**METALLIC**

Steel  
Evaporative emissions controls (10-15 pg 60)  
Superior formability with titanium steels (Youngstown Sheet & Tube) (11-1 pg 46)

**NON-METALLIC**

Plastic  
Ford FRP truck hood (9-15 pg 58)  
Ford's Louisville truck complex (9-15 pg 18)  
Plastic body panels near (U.S. Industries) (Oldsmobile) (7-15 pg 25)  
SMC plastic (Houdaille Industries) (10-15 pg 58)

**MATERIALS HANDLING**

See also New Developments, and Production  
Automation plus at Lordstown (10-1 pg 40)  
Engine cylinder liners treatment at TRW (8-1 pg 40)  
Scania's new assembly plant, Part I (Saab-Scania) (11-1 pg 38)  
Scania's new assembly plant, Part II (11-15 pg 50)

**METALLURGY**

See also Materials  
Automotive quality (Republic Steel) (8-1 pg 36)  
Superior formability with titanium steels (Youngstown Sheet & Tube) (11-1 pg 46)

**MILITARY EQUIP. & ACTIVITIES**

See also Government Agencies & Activities and Production  
Army seeking Scout vehicle (12-1 pg 39)  
GI's vehicle needs (12-1 pg 46)  
New vehicle speeds army's mobility (Pacific Car & Foundry) (12-1 pg 35)  
Testing Twister XM 808 (Lockheed Missiles & Space) (12-1 pg 43)

—N—

**NEW DEVELOPMENTS**

See also Materials

**AUTOMOTIVE MATERIALS ILLUSTRATED**

Molding, injection, large-scale (Bischoff Chemical) (8-15 pg 55)

**AUTOMOTIVE PROCESSES ILLUSTRATED**

Bending machine boosts production (Western Piping & Engineering) (10-1 pg 53)  
Eyelets, brake shoe assemblies (USM) (9-15 pg 63)  
Molding, injection, process control (Pennwalt) (10-15 pg 71)  
Welding, vacuum, plastic to steel (Carr Fastener) (8-1 pg 50)

**NEW PLANT & PRODUCTION EQUIPMENT**

Abrading machine, flat single surface (Micromatic Industries) (7-1 pg 75)  
Abrasive center, N/C (Waterbury Farrel) (9-1 pg 70)  
Analyzer, hydrocarbon (Bechman Instruments) (11-15 pg 80)  
Assembly machine (Bodine) (9-1 pg 83)  
Bar automatic, N/C control (Warner & Swasey) (10-15 pg 81)  
Bar machine, automatic (New Britain Machine) (9-1 pg 71)  
Base, transfer, rotary (Ferguson Machine) (9-1 pg 83)  
Bending machine (Teledyne Pines) (9-1 pg 70)  
Blocks, pillow (North American Rockwell) (9-1 pg 87)  
Boring, drilling, milling unit (Cincinnati Gilbert Machine Tool) (11-1 pg 53)  
Boring, gaging, connecting rods (Buhr Machine Tool) (8-15 pg 65)  
Brake, press (Heim) (9-1 pg 70)  
Burnishing unit, roller (Cogsdill Tool Products) (9-1 pg 72)  
Chip system, bar ends, coolant (Mayfran) (8-15 pg 61)  
Chucker, horizontal, N/C (Ex-Cell-O) (9-1 pg 65)  
Chucker, N/C (Motch & Merryweather Machinery) (9-1 pg 66)  
Chuckling, bar machine, preset (DeVlieg Machine) (12-1 pg 52)  
Chuckling center, N/C (Cincinnati Milacron) (11-15 pg 78)  
Cleaner, agitative, heavy parts (Sonics International) (7-15 pg 63)  
Computer production (Monarch Machine Tool) (12-1 pg 52)  
Control, welding (Miller Electric Mfg.) (10-1 pg 57)  
Counter, machine tools (Tyco Laboratories) (7-15 pg 63)  
Cutoff machine (DoAll) (9-1 pg 67)  
Cutter, laser, production (Liquid Carbonic) (8-15 pg 61)  
Damping, vibration (Austin Tool) (10-15 pg 81)  
Deburring machine, gear (Redin Production Machine) (10-15 pg 81)  
Deburring machine, vibratory (Acme Mfg.) (8-1 pg 55)  
Deposition, electronic (Rocklin Mfg.) (9-1 pg 87)  
Dieing machine, automatic (Koehring) (9-1 pg 65)  
Draw, stamping machines (Cincinnati Milacron) (8-15 pg 65)  
Drawing machine, wire, hydraulic (Fastener Engineers) (9-1 pg 71)  
Dresser, angle tangent (Engis Equipment) (9-1 pg 87)  
Drill, radial (Sheldon Machine) (9-15 pg 69)  
Drill, verticle (Leland-Gifford) (11-15 pg 80)  
Drillheads, multi-spindle (Ettco Tool & Machine) (10-1 pg 57)  
Drilling, boring machine (Gorton Machine) (9-1 pg 70)  
Drilling, tapping machine (Zagar) (11-1 pg 53)  
Extruder (Aragon Products) (8-1 pg 53)  
Fastener machine (Black & Webster) (10-1 pg 59)  
Finisher (Micromatic Industries) (9-1 pg 68)  
Finisher, gear (Lear Siegler) (9-1 pg 68)  
Fluid, synthetic, grinding (Norton) (11-1 pg 51)  
Free-abrasive machining (Speed-Fam) (7-15 pg 63)  
Furnace, draw, pit recirculating (Sunbeam Equipment) (7-1 pg 75)  
Gage, flatness (Bendix Automotive & Automation) (9-15 pg 71)  
Gage, in-process (Marposh Gauges) (9-1 pg 73)  
Gage, in-process, crankpin grinding (Marposh Gauges) (8-1 pg 55)  
Gaging system, hybrid (Bendix) (9-1 pg 68)  
Grinder, crankpin (Landis Tool) (12-1 pg 54)  
Grinder, cylindrical, hydrostatic (Brown & Sharpe) (9-1 pg 71)  
Grinder, internal (Heald Machine) (9-1 pg 70)  
Grinder, internal, hydraulic, manual control (Hunter Douglas Machinery) (8-15 pg 65)  
Grinder, metal cutting (3M) (8-1 pg 55)  
Grinder, multiple wheel (Landis Tool) (9-1 pg 67)  
Grinder, plunge (Bendix) (9-1 pg 68)  
Grinder, rotary (Mattison Machine) (9-1 pg 66)  
Grinder, snagging (SETCO Industries) (7-1 pg 75)  
Grinder, surface, rotary (Harig Products) (9-1 pg 85)  
Honing machine (Barnes Drill) (9-1 pg 64)  
Index machine, aluminum pistons (Snyder) (8-15 pg 61)  
Inserts, coated (Kennametal) (9-1 pg 87)  
Inserts, titanium carbide (VR/Wesson) (11-15 pg 78)  
Inspection machine, computer controlled (Portage Machine) (10-1 pg 59)  
Lapping machine (Crane Packing) (9-1 pg 83)  
Lathe, bar-chucking (Gisholt Machine) (9-1 pg 69)  
Lathe, contouring, N/C (Monarch Machine Tool) (9-15 pg 71)  
Lubricating composite (CMI Sales) (10-15 pg 81)  
Machining center (Kearney & Trecker) (9-1 pg 71)  
Machining center, hydrostatic, hydraulic (Giddings & Lewis) (9-1 pg 69)

- Machining center, N/C (Brown & Sharpe Mfg.) (11-15 pg 78)  
 Machining center, N/C (Cincinnati Milacron) (9-1 pg 71)  
 Machining center, N/C (Colt Industries) (11-1 pg 51)  
 Machining center, N/C (Gorton Machine Tool) (9-1 pg 85)  
 Machining center, N/C (Hillyer) (11-1 pg 53)  
 Machining center, N/C (National Automatic Tool) (9-1 pg 67)  
 Machining center, single unit, automatic (Kearney & Trecker) (12-1 pg 54)  
 Measurement, cutting time (Almar-York) (10-1 pg 59)  
 Measurement, surface (Engis Equipment) (9-1 pg 87)  
 Measurement machine (Potter Instrument) (9-1 pg 73)  
 Micro-computer, N/C (National Electro-Mechanical Systems) (11-1 pg 53)  
 Mill, end (Weldon Tool) (11-1 pg 51)  
 Mill, planer type (Kysor Industrial) (9-1 pg 83)  
 Mill, tape (Sheldon Machine) (9-1 pg 85)  
 Mills, end, throwaway (Iscar USA) (9-1 pg 73)  
 Module, spindle (Russell T. Gilman) (12-1 pg 54)  
 Molding machine, injection (Cincinnati Milacron) (10-1 pg 57)  
 Monitoring, production (Applied Systems) (8-15 pg 65)  
 Notching machine (V & O Press) (9-1 pg 85)  
 Nut, self-locking (Joseph Dyson) (9-1 pg 87)  
 Plasma system, aluminum welding (Air Products & Chemicals) (7-1 pg 75)  
 Power unit, hydraulic (Industrial Air & Hydraulics) (9-15 pg 71)  
 Press, die cast trimming (Dake) (11-1 pg 51)  
 Press, powder compacting (Parker-Hannifin) (10-15 pg 81)  
 Press, punch, N/C (Houdaille Industries) (9-15 pg 69)  
 Press, transfer feed (Danly) (9-1 pg 66)  
 Printer, vinyl (Precision Screen Machines) (8-15 pg 61)  
 Pumps (Graymills) (9-1 pg 73)  
 Rectifiers, plating, modular units (Ramm Rectifier) (8-1 pg 53)  
 Rivet setting machine (Townsend) (9-15 pg 69)  
 Riveter, quick interchange (Townsend) (7-15 pg 63)  
 Screw machine, set (Standard Pressed Steel) (9-1 pg 72)  
 Seal, thermoplastic, heavy-duty (Chemprene) (10-1 pg 57)  
 Sensor, spindle torque (S. Himelstein) (11-15 pg 80)  
 Shear, billet (Buffalo Forge) (9-1 pg 69)  
 Shrinker, hydraulic (Grotnes Machine) (9-1 pg 66)  
 Stack, power lift (Crown Controls) (9-1 pg 73)  
 Switch, limit (R. B. Denison) (9-1 pg 73)  
 Tapper, N/C, large machines (Tapmatic) (8-1 pg 53)  
 Tapper (Snow Mfg.) (9-1 pg 83)  
 Tester, gear (Gleason Works) (9-15 pg 69)  
 Tester, universal (Ametek) (12-1 pg 54)  
 Thermoformer, large-scale (Koehring) (10-1 pg 59)  
 Tool holders, recess (Federal Screw Works) (7-15 pg 63)  
 Transfer, input shafts (StarCut Sales) (9-15 pg 71)  
 Transfer, turn cylindrical parts (Snyder) (8-1 pg 55)  
 Transfer unit, portable (Livermore Automation) (9-1 pg 72)  
 Welder, inertia (Caterpillar Tractor) (8-1 pg 53)  
 Wheels, finishing (3M) (9-15 pg 69)
- NEW PRODUCTS**
- Abrasive-jet machining (Pennwalt) (9-15 pg 73)  
 Adhesives, epoxy (Daubert Chemical) (11-1 pg 57)  
 Adhesive, epoxy (RenPlastics) (8-15 pg 73)  
 Adhesive, heat-resistant (Loctite) (11-1 pg 55)  
 Adhesive, liquid (Rexco) (7-15 pg 74)  
 Air conditioners, vehicle (R. G. LeTourneau) (11-15 pg 86)  
 Bearing material, plastic (Garlock Bearings) (9-15 pg 73)  
 Bearings, linear, anti-friction (B.A.R. Bearing Mfg.) (11-1 pg 57)  
 Blade, saw, carbide-tipped (Iscar USA) (8-1 pg 59)  
 Brake, spring engaged (Horton Mfg.) (7-1 pg 77)  
 Closure unit, radiator (Scoville Mfg.) (8-15 pg 69)  
 Clutch, pull-type (Lipe-Rollway) (10-1 pg 64)  
 Composite, rigid structure, soft, surface (Uniroyal) (8-15 pg 69)  
 Compound, drawing (E. F. Houghton) (9-15 pg 75)  
 Control, emission, pneumatic noise reduction (Rex Chain-belt) (8-1 pg 59)  
 Controller, fluidic process (Applied Fluidics) (11-1 pg 55)  
 Controllers, gaging (Johnson Service) (8-15 pg 69)  
 Counterbores, drill-bore (Twentieth Century Mfg.) (9-15 pg 75)  
 Coupling, overload (Livermore Automation) (7-15 pg 76)  
 Coupling, torsional (Airborne Mfg.) (12-1 pg 56)  
 Cylinder, workholding (Applied Power Industries) (8-15 pg 69)  
 Die, urethane (Houdaille Industries) (10-1 pg 63)  
 Diesel, heavy-duty (Perkins Engines) (9-15 pg 73)  
 Drill head, adjustable (Tool Specialists) (8-1 pg 57)  
 Dryer, air, brake system (Bendix-Westinghouse Automotive Air Brake) (11-1 pg 57)  
 Emblem, trim material (D. L. Auld) (10-1 pg 63)  
 Engine, single-cylinder (Studebaker) (9-15 pg 75)  
 Engine, snowmobile (Teledyne Wisconsin Motor) (11-1 pg 57)  
 Evaluation system, radial spindle runout (Minnetech Labs.) (7-1 pg 77)  
 Fasteners, hook, loop (3M) (11-1 pg 55)  
 Fastener, removable (TRW) (10-1 pg 64)  
 Fastener, self-retaining (Standard Pressed Steel) (11-15 pg 86)  
 Fastener system, preload (Standard Pressed Steel) (12-1 pg 56)  
 Fasteners, self-drilling (Illinois Tool Works) (11-1 pg 55)  
 Filter, fuel (Stanadyne) (11-15 pg 90)  
 Filter, molten-metal (Carborundum) (10-1 pg 64)  
 Flame resistance, polyurethane foams (Michigan Chemical) (8-15 pg 73)  
 Foam, fire-resistant (Scott Paper) (12-1 pg 58)  
 Foam, urethane, flexible (Tenneco Chemicals) (11-15 pg 88)  
 Gage, ultrasonic (Branson Instruments) (10-1 pg 63)  
 Gasket material, ceramic, high temperature (Dana) (8-15 pg 73)  
 Graphite, pyrolytic, extreme environments (Ultra Carbon) (8-1 pg 59)  
 Heater core, automotive (Daniel Radiator) (8-1 pg 59)  
 Hose, thermoplastic (Imperial-Eastman) (10-1 pg 64)  
 Joint assemblies, ball (Superior Ball Joint) (7-15 pg 76)  
 Lubricating system (Olsen Mfg.) (9-15 pg 75)  
 Masking material, selective plating (MacDermid) (7-1 pg 77)  
 Metalworking fluid applying systems (Daystar) (8-1 pg 57)  
 Mill, end, threaded-tooth (Chicago-Latrobe) (12-1 pg 56)  
 Mills, end (Cleveland Twist Drill) (8-15 pg 69)  
 Motor, brake (Demag Material Handling) (11-15 pg 90)  
 Motors, AC (Reliance Electric) (8-15 pg 73)  
 Motors, fluid, servo applications (Nutron) (8-1 pg 57)  
 Nut, weld, spherical (Standard Pressed Steel) (9-15 pg 75)  
 Operator, push button (Square D) (7-15 pg 74)  
 Plastic, high-performance (Dixon) (11-15 pg 86)  
 Polymer, heat-resistant (Carborundum) (8-15 pg 73)  
 Power transmission device (Twin Disc) (8-1 pg 59)  
 Precipitation—hardening stainless steel (Colt Industries) (8-1 pg 57)  
 Preventative, rust (3M) (10-1 pg 64)  
 Pumps, hydraulic (Browne & Sharpe Mfg.) (8-15 pg 73)  
 Reinforcements, fiberglass (Owens-Corning Fiberglas) (10-1 pg 63)  
 Resin, glass-reinforced (Celanese Plastics) (9-15 pg 73)  
 Rings, packing, graphite (Union Carbide) (8-1 pg 59)  
 Rod ends, threaded, blank (Jerigens) (9-15 pg 73)  
 Rubber, elastomeric, suspension (Granning Suspensions) (7-1 pg 77)  
 Seal, mechanical (Sealol) (10-1 pg 63)  
 Seat, heavy trucks (Universal Oil Products) (11-1 pg 57)  
 Servovalve, torque-motor (Abex) (8-15 pg 73)  
 Shafts, flexible (Stow Mfg.) (10-1 pg 63)  
 Steel, deep-drawing (Armco Steel) (12-1 pg 56)  
 Steel, die (Colt Industries) (10-1 pg 64)  
 Suspension, air (International Harvester) (8-15 pg 73)  
 Suspension system (Mor/Ryde) (10-1 pg 63)  
 Switch, coding, automated programming (Bendix Automotive & Automation) (7-1 pg 77)  
 Tachometer, electronic (Engler Instrument) (10-1 pg 64)  
 Tape, flame-retardant (Kendall) (9-15 pg 73)  
 Teflon film, rubber "slip" (Acushnet) (8-1 pg 57)  
 Thermoplastic, copolymer (Richardson) (8-1 pg 59)  
 Thermoplastics, flexible (Allied Chemical) (8-1 pg 57)  
 Tie, cable, releaseable (3M) (7-15 pg 74)  
 Titanium process (Kolene) (8-15 pg 73)  
 Transmission, rapid-shift (Ramsey Winch) (8-15 pg 69)  
 Tubing, flexible, high-vacuum uses (Cajon) (7-1 pg 77)  
 Valve, check, automatic (Energy Mfg.) (11-1 pg 55)  
 Valve, fuel check (Parker Hannifin) (9-15 pg 75)  
 Valve, pressure relief (Sperry Rand) (12-1 pg 58)  
 Valve, relief, spring (Double A Products) (10-1 pg 64)  
 Valve, selector (Prince Hydraulics) (11-15 pg 88)  
 Welding gun (Bernard) (7-15 pg 74)  
 Yarn, asbestos (Nicolet Industries) (11-1 pg 55)

—O—  
 Oils & Oiling—See Lubrication & Lubricants  
 Organization—See Associations & Organizations and Meetings

—P—  
**PAINTING**  
 Scania's new assembly plant, Part II (11-15 pg 50)

**PASSENGER CARS**  
 See also Production

**DESIGN**  
 General  
 British Leyland studies family car (7-1 pg 54)  
 Cadillac get fresh styling (9-15 pg 53)  
 Chevrolet longer (9-15 pg 43)  
 Comet resurrected (8-15 pg 47)  
 Dodge Demon bows (9-15 pg 55)



Engineering the Porsche car, Part I (11-1 pg 34)  
 Engineering the Porsche car, Part II (11-15 pg 54)  
 Matador sparks AMC line (8-15 pg 50)  
 Mid-engine flood due? (GM) (Ford) (AMC) (7-15 pg 18)  
 "The mini bonanza" (Editorial) (11-1 pg 27)  
 Oldsmobile's record changes (9-15 pg 46)  
 Pinto is star for Ford stable (8-15 pg 43)  
 Pontiac's 36 models (9-15 pg 50)  
 Quality control, Part I (Chrysler) (10-1 pg 37)  
 Quality control, Part II (Cadillac) (10-15 pg 20)  
 Quality control, Part IV (Chrysler) (11-15 pg 24)  
 Range Rover station wagon (British Leyland Motor) (10-15 pg 67)  
 VW Super Beetle (11-1 pg 43)  
 Vega . . . GM's new mini (8-15 pg 39)  
 Volkswagen of America (7-1 pg 51)  
 A woman's car? (Editorial) (12-15 pg 31)

**Components**

Anti-skid unit hailed (Bendix) (Chrysler) (10-15 pg 18)  
 Anti-spin device for '71 (GM) (10-1 pg 33)  
 Evaporative emissions controls (10-15 pg 60)

**Engines**

Dow Chemical fills cooling gap (8-15 pg 53)  
 Engines '71: getting them to church (10-1 pg 45)

**PRODUCTION**

**Bodies**

Plastic body panels near (U.S. Industries) (Oldsmobile) (7-15 pg 25)  
 Power tools, Part III (Ingersoll-Rand) (11-15 pg 45)

**STATISTICS**

**Exports**

French export 56% of cars (Simca) (7-1 pg 59)

**Registrations (Total)**

Output for 1969 sagged . . . foreign production rose (7-1 pg 66)

**PLANTS & FACILITIES**

**NEW, CHANGES & OPERATIONS**

Airless spray buffing (M & T Chemicals) (11-1 pg 41)  
 Automation plus at Lordstown (10-1 pg 40)  
 Brake shoe assembly at GM (9-1 pg 22)  
 Ford's Louisville truck complex (9-15 pg 18)  
 Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
 Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)  
 Power tools, Part II (Ingersoll-Rand) (11-1 pg 29)  
 Quality control, Part III (Ford) (11-1 pg 21)  
 SMC plastic (Houdaille Industries) (10-15 pg 58)

Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)

**FOREIGN**

Scania's new assembly plant, Part I (11-1 pg 38)  
 Scania's new assembly plant, Part II (11-15 pg 50)

**POLLUTION**

Evaporative emissions controls (10-15 pg 60)  
 Lead-free gasoline (Ford) (8-1 pg 33)

**PRODUCTION**

See also Agricultural Equip., Construction Equip., Engines, Passenger Cars, and Trucks

**GENERAL**

Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
 Making production pay in the 1970's (Sundstrand) (9-1 pg 35)

**ASSEMBLY**

Automation plus at Lordstown (10-1 pg 40)  
 Brake shoe assembly at GM (9-1 pg 22)  
 Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)  
 Scania's new assembly plant, Part I (Saab-Scania) (11-1 pg 38)

**FINISHING**

Airless spray buffing (M & T Chemicals) (11-1 pg 41)  
 Engine cylinder liners treatment at TRW (8-1 pg 40)

**MACHINING**

Computer controlled machining (Ex-Cell-O) (7-15 pg 51)  
 Gear cutter has novel design (Sipco Machine) (10-15 pg 65)

**QUALITY CONTROL, RELIABILITY**

Quality control, Part I (Chrysler) (10-1 pg 37)  
 Quality control, Part II (Cadillac) (10-15 pg 20)  
 Quality control, Part III (Ford) (11-1 pg 21)  
 Quality control, Part IV (Chrysler) (11-15 pg 24)  
 Quality control, Part V (Chevrolet) (12-1 pg 25)  
 Quality control, Part VI (AMC) (12-15 pg 22)

**PURCHASING**

Assembly plant power tools, Part II (Ingersoll-Rand) (11-1 pg 29)



**QUALITY CONTROL, RELIABILITY**

See also Production  
 Automotive quality (Republic Steel) (8-1 pg 36)

Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)



**RACING (Auto)**

Auto racing: problems in the round (Editorial) (10-1 pg 31)  
 Engineering the Porsche car, Part I (11-1 pg 34)  
 Engineering the Porsche car, Part II (11-15 pg 54)  
 Registrations—See Passenger Cars, Trucks  
 Reliability—See Production



**SAFETY**

Brake tubing (Bundy) (10-15 pg 63)  
 Breaking the sound barrier (Editorial) (8-1 pg 31)  
 Ford's Louisville truck complex (9-15 pg 18)  
 The high cost of mending (7-15 pg 33)  
 Linear motor impact tests (7-15 pg 39)  
 Power tools, Part III (Ingersoll-Rand) (11-15 pg 45)  
 Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)

**SHOWS**

See also Meetings  
 Machine tool show preview (9-1 pg 64)  
 Production engineering show preview (9-1 pg 72)

**SPECIAL PURPOSE VEHICLES**

ATVs: New wheels of man (Editorial) (9-15 pg 41)  
 Recreational vehicles (7-15 pg 25)  
 Specifications—See Agricultural Equip., Construction Equip., Engines, Marine, Passenger Cars, and Trucks  
 Sports Cars—See Passenger Cars

**STANDARDS**

Evaporative emissions controls (10-15 pg 60)  
 The metric system (Perkins Engines) (11-15 pg 22)  
 Quality control, Part V (Chevrolet) (12-1 pg 25)  
 Quality control, Part VI (AMC) (12-15 pg 22)



Tanks—See Military Equip. & Activities

**TESTING**

Army seeking Scout vehicle (12-1 pg 39)

Brake tubing (Bundy) (10-15 pg 62)  
 Ford FRP truck hood (9-15 pg 58)  
 Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
 Linear motor impact tests (7-15 pg 39)  
 Quality control, Part II (Cadillac) (10-15 pg 20)  
 Skid control quality assurance (Kelsey-Hayes) (Ford) (8-1 pg 43)  
 Testing Twister XM 808 (Lockheed Missiles & Space) (12-1 pg 43)

**TRANSMISSIONS**

See also Agricultural Equip., Construction Equip., Marine, Passenger Cars, and Trucks

**PRODUCTION**

Range Rover station wagon (British Leyland Motor) (10-15 pg 67)

**Hydrostatic**

Hydro-tractors: reality in iron (I-H) (10-1 pg 49)

**TRUCKS**

**DESIGN**

**Engines**

New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)

**PRODUCTION**

**General**

Ford's Louisville truck complex (9-15 pg 18)

**Bodies**

Ford FRP truck hood (9-15 pg 58)  
 Scania's new assembly plant, Part I (11-1 pg 38)  
 Scania's new assembly plant, Part II (11-15 pg 50)

**Engines**

Engine cylinder liners treatment at TRW (8-1 pg 40)

**STATISTICS**

**Registrations (Total)**

Output for 1969 sagged . . . foreign production rose (7-1 pg 66)



Unions—See Associations & Organizations



Wages—See Employment

**WELDING**

Automation plus at Lordstown (10-1 pg 40)  
 Electron beams and lasers (Union Carbide) (8-1 pg 46)

**AUTHORS**

**—B—**

**BOGGS, J. J.**  
Power tools, Part II (Ingersoll-Rand) (11-1 pg 29)  
**BUNDER, GEORGE D.**  
Automotive quality (Republic Steel) (8-1 pg 36)

**—C—**

**CALLAHAN, JOSEPH M.**  
Mid-engine flood due? (GM) (Ford) (AMC) (7-15 pg 18)  
Quality control, Part I (Chrysler) (10-1 pg 37)  
Quality control, Part II (Cadillac) (10-15 pg 20)  
Quality control, Part III (Ford) (11-1 pg 21)  
Quality control, Part IV (Chrysler) (11-15 pg 24)  
Quality control, Part V (Chevrolet) (12-1 pg 25)  
Quality control, Part VI (AMC) (12-15 pg 22)  
**CARPENTER, C. L.**  
Power tools, Part III (Ingersoll-Rand) (11-15 pg 45)

**—E—**

**ESHELMAN, RALPH H.**  
Automation plus at Lordstown (10-1 pg 40)  
Brake shoe assembly at GM (9-1 pg 22)  
Electron beams and lasers (8-1 pg 46)  
Ford's Louisville truck complex (9-15 pg 18)  
Hydro-tractors: reality in iron (I-H) (10-1 pg 49)  
Plastic body panels near (U.S. Industries) (Oldsmobile) (7-15 pg 25)  
**EZELL, J. V.**  
Power tools, Part I (Ingersoll-Rand) (10-15 pg 53)

**—G—**

**GATCHEL, K. J.**  
Airless spray buffing (M & T Chemicals) (11-1 pg 41)  
**GAYDOS, LAWRENCE E.**  
Army seeking Scout vehicle (12-1 pg 39)  
**GESCHELIN, JOSEPH**  
Engines '71: getting them to church (10-1 pg 45)  
Federal-Mogul ideas (7-15 pg 43)  
Ford: a shift in materials (8-1 pg 48)  
**GUSTAFSON, BURNELL A.**  
Making production pay in the 1970's (Sundstrand) (9-1 pg 35)

**—H—**

**HARTWELL, NEVILLE**  
The metric system (Perkins Engines) (11-15 pg 22)  
**HURFORD, ELLWOOD C.**  
GI's vehicle needs (12-1 pg 46)

**—L—**

**LLOYD, NORMAN M.**  
ATVs: New wheels of man (Editorial) (9-15 pg 41)  
Auto racing: problems in the round (Editorial) (10-1 pg 31)  
The bell tolls (Editorial) (10-15 pg 43)  
Breaking the sound barrier (Editorial) (8-1 pg 31)  
The dream spinners and the "Disproduct" (Editorial) (7-1 pg 49)  
The high cost of mending (Editorial) (7-15 pg 33)  
"The mini bonanza" (Editorial) (11-1 pg 27)  
Perilous pact (Editorial) (12-1 pg 33)  
A question of style (Editorial) (8-15 pg 37)  
A woman's car? (Editorial) (12-15 pg 31)  
The 75th year itch (Editorial) (11-15 pg 43)

**—Mc—**

**McOSKER, WM. F.**  
Army seeking Scout vehicle (12-1 pg 39)

**—N—**

**NELSON, HAROLD M.**  
Engineering the Porsche car, Part I (11-1 pg 34)  
Engineering the Porsche car, Part II (11-15 pg 54)

**—R—**

**REDDY, PAUL A.**  
Output for 1969 sagged . . . foreign production rose (7-1 pg 66)

**—S—**

**SCOTT, DAVID**  
British Leyland studies family car (7-1 pg 54)  
European Round-up (7-15 pg 27) (8-15 pg 28) (9-15 pg 24) (10-15 pg 24) (11-15 pg 28) (12-15 pg 24)  
French export 56% of cars (Simca) (7-1 pg 59)  
Lead-free gasoline (Ford) (8-1 pg 33)  
Linear motor impact tests (7-15 pg 39)  
Range Rover station wagon (British Leyland Motor) (10-15 pg 67)  
Scania's new assembly plant, Part I (11-1 pg 38)  
Scania's new assembly plant, Part II (11-15 pg 50)  
**SEGAL, ISAAC**  
Superior formability with titanium steels (Youngstown Sheet & Tube) (11-1 pg 46)

**—W—**

**WEINERT, CHARLES A.**  
New "work" engines, Part I (Ford) (I-H) (11-15 pg 58)  
U.S. production equipment overseas (7-15 pg 45)  
Volkswagen of America (7-1 pg 51)

**COMPANIES**

**—A—**

**ABEX CORP.**  
Servovalve, torque-motor (8-15 pg 73)  
**ACME MFG. CO.**  
Deburring machine, vibratory (8-1 pg 55)  
**ACUSHNET CO.**  
Teflon film, rubber "slip" (8-1 pg 57)  
**AIR PRODUCTS & CHEMICALS, INC.**  
Plasma system, aluminum welding (7-1 pg 75)  
**AIRBORNE MFG. CO.**  
Coupling, torsional (12-1 pg 56)  
**ALLIED CHEMICAL CORP.**  
Thermoplastics, flexible (8-1 pg 57)  
**ALMAR-YORK CO.**  
Measurement, cutting time (10-1 pg 59)  
**AMERICAN MOTORS CORP.**  
Matador sparks AMC line (8-15 pg 50)  
Mid-engine flood due? (7-15 pg 18)  
Quality control, Part VI (12-15 pg 22)  
**AMETEK, INC.**  
Tester, universal (12-1 pg 54)  
**APPLIED FLUIDICS, INC.**  
Controller, fluidic process (11-1 pg 55)  
**APPLIED POWER INDUSTRIES, INC.**  
Cylinder, workholding (8-15 pg 69)  
**APPLIED SYSTEMS CORP.**  
Monitoring, production (8-15 pg 65)  
**ARAGON PRODUCTS, INC.**  
Extruder (8-1 pg 53)  
**ARMCO STEEL CORP.**  
Steel, deep-drawing (12-1 pg 56)  
**AULD, D. L. CO.**  
Emblem, trim material (10-1 pg 63)  
**AUSTIN TOOL CO.**  
Damping, vibration (10-15 pg 81)

**—B—**

**B.A.R. BEARING MFG. CORP.**  
Bearings, linear, anti-friction (11-1 pg 57)  
**BARNES DRILL CO.**  
Honing machine (9-1 pg 64)  
**BECKMAN INSTRUMENTS, INC.**  
Analyzer, hydrocarbon (11-15 pg 80)  
**BENDIX AUTOMOTIVE & AUTOMATION CO.**  
Gage, flatness (9-15 pg 71)

Switch, coding, automated programming (7-1 pg 77)  
**BENDIX CORP.**  
Anti-skid unit hailed (10-15 pg 18)  
Gaging system, hybrid (9-1 pg 68)  
Grinder, plunge (9-1 pg 68)  
**BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO.**  
Dryer, air, brake system (11-1 pg 57)  
**BERNARD CO.**  
Welding gun (7-15 pg 74)  
**BISCHOFF CHEMICAL CORP.**  
Molding, injection, large-scale (8-15 pg 55)  
**BLACK & WEBSTER, INC.**  
Fastener machine (10-1 pg 59)  
**BODINE CORP.**  
Assembly machine (9-1 pg 83)  
**BRANSON INSTRUMENTS CO.**  
Gage, ultrasonic (10-1 pg 63)  
**BRITISH LEYLAND MOTOR CORP. (England)**  
British Leyland studies family car (7-1 pg 54)  
Range Rover station wagon (10-15 pg 67)  
**BROWN & SHARPE MFG. CO.**  
Grinder, cylindrical, hydrostatic (9-1 pg 71)  
Machining center, N/C (11-15 pg 78)  
Pumps, hydraulic (8-15 pg 73)  
**BUFFALO FORGE CO.**  
Shear, billet (9-1 pg 69)  
**BUHR MACHINE TOOL CORP.**  
Boring, gaging, connecting rods (8-15 pg 65)  
**BUNDY CORP.**  
Brake tubing (10-15 pg 63)

**—C—**

**CMI SALES, INC.**  
Lubricating composite (10-15 pg 81)  
**CADILLAC MOTOR CAR DIV., GM CORP.**  
Cadillac gets fresh styling (9-15 pg 53)  
Quality control, Part II (10-15 pg 20)  
**CAJON CO.**  
Tubing, flexible, high-vacuum uses (7-1 pg 77)  
**CARBORUNDUM CO.**  
Filter, molten-metal (10-1 pg 64)  
Polymer, heat-resistant (8-15 pg 73)  
**CARR FASTENER CO.**  
Welding, vacuum, plastic to steel (8-1 pg 50)  
**CATERPILLAR TRACTOR CO.**  
Welder, inertia (8-1 pg 53)  
**CELANESE PLASTICS CO.**  
Resin, glass-reinforced (9-15 pg 73)  
**CHEMPRENE, INC.**  
Seal, thermoplastic, heavy-duty (10-1 pg 57)  
**CHEVROLET MOTOR DIV., GM CORP.**  
Automation plus at Lordstown (10-1 pg 40)  
Chevrolets longer (9-15 pg 43)  
Quality control, Part V (12-1 pg 25)

Vega . . . GM's new mini (8-15 pg 39)

**CHICAGO-LATROBE**

Mill, end, threaded-tooth (12-1 pg 56)

**CHRYSLER CORP.**

Anti-skid unit hailed (10-15 pg 18)

Quality control, Part I (10-1 pg 37)

Quality control, Part IV (11-15 pg 24)

**CINCINNATI GILBERT****MACHINE TOOL CO.**

Boring, drilling, milling unit (11-1 pg 53)

**CINCINNATI MILACRON CO.**

Chucking center, N/C (11-15 pg 78)

Draw, stamping machines (8-15 pg 65)

Machining center, N/C (9-1 pg 71)

Molding machine, injection (10-1 pg 57)

**CLEVELAND TWIST****DRILL CO.**

Mills, end (8-15 pg 69)

**COGSDILL TOOL PRODUCTS, INC.**

Burnishing unit, roller (9-1 pg 72)

**COLT INDUSTRIES**

Machining center, N/C (11-1 pg 51)

Precipitation—hardening stainless steel (8-1 pg 57)

Steel, die (10-1 pg 64)

**CRANE PACKING CO.**

Lapping machine (9-1 pg 83)

**CROWN CONTROLS CORP.**

Stacker, power lift (9-1 pg 73)

**—D—****DAKE CORP.**

Press, die cast trimming (11-1 pg 51)

**DANA CORP.**

Gasket material, ceramic, high temperature (8-15 pg 73)

**DANIEL RADIATOR CORP.**

Heater core, automotive (8-1 pg 59)

**DANLY MACHINE CO.**

Press, transfer feed (9-1 pg 66)

**DAUBERT CHEMICAL CO.**

Adhesives, epoxy (11-1 pg 57)

**DAYSTAR CORP.**

Metalworking fluid applying systems (8-1 pg 57)

**DEMAG MATERIAL****HANDLING CORP.**

Motor, brake (11-15 pg 90)

**DENISON, R. B., INC.**

Switch, limit (9-1 pg 73)

**DEVLIEG MACHINE CO.**

Chucking, bar machine, preset (12-1 pg 52)

**DIXON CORP.**

Plastic, high-performance (11-15 pg 86)

**DOALL CO.**

Cutoff machine (9-1 pg 67)

**DODGE CAR & TRUCK DIV.,****CHRYSLER CORP.**

Dodge Demon bows (9-15 pg 55)

**DOUBLE A PRODUCTS CO.**

Valve, relief, spring (10-1 pg 64)

**DOW CHEMICAL CO.**

Dow Chemical fills cooling gap (8-15 pg 53)

**DYSON, JOSEPH & SONS, INC.**

Nut, self-locking (9-1 pg 87)

**—E—****ENERGY MFG. CO.**

Valve, check, automatic (11-1 pg 55)

**ENGIS EQUIPMENT CO.**

Dresser, angle tangent (9-1 pg 87)

Measurement, surface (9-1 pg 87)

**ENGLER INSTRUMENT CO.**

Tachometer, electronic (10-1 pg 64)

**ETTICO TOOL &****MACHINE CO.**

Drillheads, multi-spindle (10-1 pg 57)

**EX-CELL-O CORP.**

Chuck, horizontal, N/C (9-1 pg 65)

Computer controlled machining (7-15 pg 51)

**—F—****FASTENER ENGINEERS, INC.**

Drawing machine, wire, hydraulic (9-1 pg 71)

**FEDERAL-MOGUL CORP.**

Federal-Mogul ideas (7-15 pg 43)

**FEDERAL SCREW WORKS**

Tool holders, recess (7-15 pg 63)

**FERGUSON MACHINE CO.**

Base, transfer, rotary (9-1 pg 83)

**FORD DIV., FORD MOTOR CO.**

Pinto is star for Ford stable (8-15 pg 43)

**FORD MOTOR CO.**

Ford: a shift in materials (8-1 pg 48)

Ford FRP truck hood (9-15 pg 58)

Ford's Louisville truck complex (9-15 pg 18)

Mid-engine flood due? (7-15 pg 18)

New "work" engines, Part I (11-15 pg 58)

Quality control, Part III (11-1 pg 21)

Skid control quality assurance (8-1 pg 43)

**FORD MOTOR CO. (England)**

Lead-free gasoline (8-1 pg 33)

**—G—****GARLOCK BEARINGS, INC.**

Bearing material, plastic (9-15 pg 73)

**GENERAL MOTORS CORP.**

Anti-spin device for '71 (10-1 pg 33)

Mid-engine flood due? (7-15 pg 18)

Perilous pact (Editorial) (12-1 pg 33)

**GENERAL MOTORS OF****CANADA, LTD.**

Brake shoe assembly at GM (9-1 pg 22)

**GIDDINGS & LEWIS, INC.**

Machining center, hydrostatic, hydraulic (9-1 pg 69)

**GILMAN, RUSSELL T.**

Module, spindle (12-1 pg 54)

**GISHOLT MACHINE CO.**

Lathe, bar-chucking (9-1 pg 69)

**GLEASON WORKS**

Tester, gear (9-15 pg 69)

**GORTON MACHINE CORP.**

Drilling, boring machine (9-1 pg 70)

Machining center, N/C (9-1 pg 85)

**GRANNING SUSPENSIONS, INC.**

Rubber, elastomeric, suspension (7-1 pg 77)

**GRAYMILLS CORP.**

Pumps (9-1 pg 73)

**GROTNES MACHINE****WORKS, INC.**

Shrinker, hydraulic (9-1 pg 66)

**—H—****HARIG PRODUCTS, INC.**

Grinder, surface, rotary (9-1 pg 85)

**HEALD MACHINE CO.**

Grinder, internal (9-1 pg 70)

**HEIM CORP.**

Brake, press (9-1 pg 70)

**HILLYER CORP.**

Machining center, N/C (11-1 pg 53)

**HIMMELSTEIN, S. & CO.**

Sensor, spindle torque (11-15 pg 80)

**HORTON MFG. CO.**

Brake, spring engaged (7-1 pg 77)

**HOUDAILLE INDUSTRIES, INC.**

Die, urethane (10-1 pg 63)

Press, punch, N/C (9-15 pg 69)

SMC plastic (10-15 pg 58)

**HOUGHTON, E. F. & CO.**

Compound, drawing (9-15 pg 75)

**HUNTER DOUGLAS****MACHINERY CORP.**

Grinder, internal, hydraulic, manual control (8-15 pg 65)

**—I—****ILLINOIS TOOL WORKS, INC.**

Fasteners, self-drilling (11-1 pg 55)

**IMPERIAL-EASTMAN CORP.**

Hose, thermoplastic (10-1 pg 64)

**INDUSTRIAL AIR &****HYDRAULICS, INC.**

Power unit, hydraulic (9-15 pg 71)

**INGERSOLL-RAND CO.**

Assembly plant power tools, Part I (10-15 pg 53)

Power tools, Part II (11-1 pg 29)

Power tools, Part III (11-15 pg 45)

**INTERNATIONAL****HARVESTER CO.**

Hydro-tractors: reality in iron (10-1 pg 49)

New "work" engines, Part I (11-15 pg 58)

Suspension, air (8-15 pg 73)

**ISCAR USA, INC.**

Blade, saw, carbide-tipped (8-1 pg 59)

Mills, end, throwaway (9-1 pg 73)

**—J—****JERGENS, INC.**

Rod ends, threaded, blank (9-15 pg 73)

**JOHNSON SERVICE CO.**

Controllers, gaging (8-15 pg 69)

**—K—****KEARNEY & TRECKER CORP.**

Machining center (9-1 pg 71)

Machining center, single unit, automatic (12-1 pg 54)

**KELSEY-HAYES, INC.**

Skid control quality assurance (8-1 pg 43)

**KEDALL CO.**

Tape, flame-retardant (9-15 pg 73)

**KENNAMETAL, INC.**

Inserts, coated (9-1 pg 87)

**KOEHRING CO.**

Dieing machine, automatic (9-1 pg 65)

Thermoformer, large-scale (10-1 pg 59)

**KOLENE CORP.**

Titanium process (8-15 pg 73)

**KYSOR INDUSTRIAL CORP.**

Milling machine, planer type (9-1 pg 83)

**—L—****LANDIS TOOL CO.**

Grinder, crankpin (12-1 pg 54)

Grinder, multiple wheel (9-1 pg 67)

**LEAR SIEGLER, INC.**

Finisher, gear (9-1 pg 68)

**LELAND-GIFFORD CO.**

Drill, verticle (11-15 pg 80)

**LeTOURNEAU, R. G., INC.**

Air conditioners, vehicle (11-15 pg 86)

**LINCOLN-MERCURY DIV.,****FORD MOTOR CO.**

Comet resurrected (8-15 pg 47)

**LIPE-ROLLWAY CORP.**

Clutch, pull-type (10-1 pg 64)

**LIQUID CARBONIC CORP.**

Cutter, laser, production (8-15 pg 61)

**LIVVERNOIS AUTOMATION****CO.**

Coupling, overload (7-15 pg 76)

Transfer unit, portable (9-1 pg 72)

**LOCKHEED MISSILES &****SPACE CO.**

Testing Twister XM 808 (12-1 pg 43)

**LOCTITE CORP.**

Adhesive, heat-resistant (11-1 pg 55)

**—M—****M & T CHEMICALS, INC.**

Airless spray buffing (11-1 pg 41)



**MacDERMID, INC.**

Masking material, selective plating (7-1 pg 77)

**MARPOSS GAUGES CORP.**

Gage, in-process (9-1 pg 73)  
Gage, in-process, crankpin grinding (8-1 pg 55)

**MATTISON MACHINE WORKS**

Grinder, rotary (9-1 pg 66)

**MAYFRAN, INC.**

Chip system, bar ends, coolant (8-15 pg 61)

**MICHIGAN CHEMICAL CORP.**

Flame resistance, polyurethane forms (8-15 pg 73)

**MICROMATIC INDUSTRIES, INC.**

Abrading machine, flat single surface (7-1 pg 75)

Finishing machine (9-1 pg 68)

**MILLER ELECTRIC MFG. CO.**

Control, welding (10-1 pg 57)

**MINNETECH LABS, INC.**

Evaluation system, radial spindle runout (7-1 pg 77)

**MONARCH MACHINE TOOL CO.**

Computer production (12-1 pg 52)

Lathe, contouring, N/C (9-15 pg 71)

**MOR/RYDE, INC.**

Suspension system (10-1 pg 63)

**MOTCH & MERRYWEATHER MACHINERY CO.**

Chucker, N/C (9-1 pg 66)

**—N—**

**NATIONAL AUTOMATIC TOOL CO., INC.**

Machining center, N/C (9-1 pg 67)

**NATIONAL ELECTRO-MECHANICAL SYSTEMS, INC.**

Micro-computer, N/C (11-1 pg 53)

**NEW BRITAIN MACHINE CO.**

Bar machine, automatic (9-1 pg 71)

**NICOLET INDUSTRIES, INC.**

Yarn, asbestos (11-1 pg 55)

**NORTH AMERICAN ROCKWELL**

Blocks, pillow (9-1 pg 87)

**NORTON CO.**

Fluid, synthetic, grinding (11-1 pg 51)

**NUTRON CORP.**

Motors, fluid, servo applications (8-1 pg 57)

**—O—**

**OLDSMOBILE DIV., GM CORP.**

Oldsmobile's record changes (9-15 pg 46)

Plastic body panels near (7-15 pg 25)

**OLSEN MFG. CO., INC.**

Lubricating system (9-15 pg 75)

**OWENS-CORNING FIBERGLAS CORP.**

Reinforcements, fiberglass (10-1 pg 63)

**—P—**

**PACIFIC CAR & FOUNDRY CO.**

New vehicle speeds army's mobility (12-1 pg 35)

**PARKER-HANNIFIN CORP.**

Press, powder compacting (10-15 pg 81)

Valve, fuel check (9-15 pg 75)

**PENNWALT CORP.**

Abrasive-jet machining (9-15 pg 73)

Molding, injection, process control (10-15 pg 71)

**PERKINS ENGINES, INC.**

Diesel, heavy-duty (9-15 pg 73)

The metric system (11-15 pg 22)

**PONTIAC MOTOR DIV., GM CORP.**

Pontiac's 36 models (9-15 pg 50)

Porsche (Germany)

Engineering the Porsche car, Part I (11-1 pg 34)

Engineering the Porsche car, Part II (11-15 pg 54)

**PORTAGE MACHINE CO.**

Inspection machine, computer controlled (10-1 pg 59)

**POTTER INSTRUMENT CO., INC.**

Measurement machine (9-1 pg 73)

**PRECISION SCREEN MACHINES, INC.**

Printer, vinyl (8-15 pg 61)

**PRINCE HYDRAULICS, INC.**

Valve, selector (11-15 pg 88)

**—R—**

**RAMM RECTIFIER CO.**

Rectifiers, plating, modular units (8-1 pg 53)

**RAMSEY WINCH CO.**

Transmission, rapid-shift (8-15 pg 69)

**REDIN PRODUCTION MACHINE CO.**

Deburring machine, gear (10-15 pg 81)

**RELIANCE ELECTRIC CO.**

Motors, AC (8-15 pg 73)

**REN PLASTICS, INC.**

Adhesive, epoxy (8-15 pg 73)

**REPUBLIC STEEL CORP.**

Automotive quality (8-1 pg 36)

**REX CHAIN-BELT, INC.**

Control, emission, pneumatic noise reduction (8-1 pg 59)

**REXCO CORP.**

Adhesive, liquid (7-15 pg 74)

**RICHARDSON CO.**

Thermoplastic, copolymer (8-1 pg 59)

**ROCKLIN MFG. CO.**

Deposition, electronic (9-1 pg 87)

**—S—**

**SETCO INDUSTRIES, INC.**

Grinder, snagging (7-1 pg 75)

**SAAB-SCANIA (Sweden)**

Scania's new assembly plant, Part I (11-1 pg 38)

Scania's new assembly plant, Part II (11-15 pg 50)

**SCOTT PAPER CO.**

Foam, fire-resistant (12-1 pg 58)

**SCOVILLE MFG. CO.**

Closure unit, radiator (8-15 pg 69)

**SEALOL, INC.**

Seal, mechanical (10-1 pg 63)

**SHELDON MACHINE CO., INC.**

Drill, radial (9-15 pg 69)

Mill, tape (9-1 pg 85)

**SIMCA (France)**

French export 56% of cars (7-1 pg 59)

**SIPCO MACHINE CO.**

Gear cutter has novel design (10-15 pg 65)

**SNOW MFG. CO.**

Tapping machine (9-1 pg 83)

**SNYDER CORP.**

Index machine, aluminum pistons (8-15 pg 61)

Transfer, turn cylindrical parts (8-1 pg 55)

**SONICS INTERNATIONAL, INC.**

Cleaner, agitator, heavy parts (7-15 pg 63)

**SPEEDFAM CORP.**

Free-abrasive machining (7-15 pg 63)

**SPERRY RAND CORP.**

Valve, pressure relief (12-1 pg 58)

**SQUARE D CO.**

Operator, push button (7-15 pg 74)

**STANADYNE, INC.**

Filter, fuel (11-15 pg 90)

**STANDARD PRESSED STEEL CO.**

Fastener, self-retaining (11-15 pg 86)

Fastener system, preload (12-1 pg 56)

Nut, weld, spherical (9-15 pg 75)

Screw machine, set (9-1 pg 72)

**STARCUT SALES, INC.**

Transfer, input shafts (9-15 pg 71)

**STOW MFG. CO.**

Shafts, flexible (10-1 pg 63)

**STUDEBAKER CORP.**

Engine, single-cylinder (9-15 pg 75)

**SUNBEAM EQUIPMENT CORP.**

Furnace, draw, pit recirculating (7-1 pg 75)

**SUNDSTRAND CORP.**

Making production pay in the 1970's (9-1 pg 35)

**SUPERIOR BALL JOINT CO.**

Joint assemblies, ball (7-15 pg 76)

**—T—**

**TRW, INC.**

Engine cylinder liners treatment at TRW (8-1 pg 40)

Fastener, removable (10-1 pg 64)

**TAPMATIC CORP.**

Tapper, N/C, large machines (8-1 pg 53)

**TELEDYNE PINES**

Bending machine (9-1 pg 70)

**TELEDYNE WISCONSIN MOTOR**

Engine, snowmobile (11-1 pg 57)

**TENNECO CHEMICALS, INC.**

Foam, urethane, flexible (11-15 pg 88)

**3M CO.**

Fasteners, hook, loop (11-1 pg 55)

Grinder, metal cutting (8-1 pg 55)

Preventative, rust (10-1 pg 64)

Tie, cable, releaseable (7-15 pg 74)

Wheels, finishing (9-15 pg 69)

**TOOL SPECIALISTS, INC.**

Drill head, adjustable (8-1 pg 57)

**TOWNSEND CO.**

Rivet setting machine (9-15 pg 69)

Riveter, quick interchange (7-15 pg 63)

**TWENTIETH CENTURY MFG. CO.**

Counterbores, drill-bore (9-15 pg 75)

**TWIN DISC, INC.**

Power transmission device (8-1 pg 59)

**TYCO LABORATORIES, INC.**

Counter, machine tools (7-15 pg 63)

**—U—**

**U.S. INDUSTRIES, INC.**

Plastic body panels near (7-15 pg 25)

**USM CORP.**

Eyelets, brake shoe assemblies (9-15 pg 63)

**ULTRA CARBON CORP.**

Graphite, pyrolytic, extreme environments (8-1 pg 59)

**UNION CARBIDE CORP.**

Electron beams and lasers (8-1 pg 46)

Rings, packing, graphite (8-1 pg 59)

**UNIROYAL, INC.**

Composite, rigid structure, soft surface (8-15 pg 69)

**UNIVERSAL OIL PRODUCTS CO.**

Seat, heavy truck (11-1 pg 57)

**—V—**

**V & O PRESS CO.**

Notching machine (9-1 pg 85)

**VR/WESSON CO.**

Inserts, titanium carbide (11-15 pg 78)

**VOLKSWAGEN OF AMERICA, INC.**

VW Super Beetle (11-1 pg 43)

Volkswagen of America (7-1 pg 51)

**—W—**

**WARNER & SWASEY CO.**

Bar automatic, N/C control (10-15 pg 81)

**WATERBURY FARREL**

Abrasive center, N/C (9-1 pg 70)

**WELDON TOOL CO.**

Mill, end (11-1 pg 51)

**WESTERN PIPING & ENGINEERING CO.**

Bending machine boosts production (10-1 pg 53)

**—Y—**

**YOUNGSTOWN SHEET & TUBE CO.**

Superior formability with titanium steels (11-1 pg 46)

**—Z—**

**ZAGAR, INC.**

Drilling-tapping machine (11-1 pg 53)



